INDIA RUBBER WORLD
FOUNDED 1889
CAOUTCHOUC GUTTA-PERCHA

Reg. United States Pat. Off. Reg. United Kingdom.

Published on the 1st of each month by

THE INDIA RUBBER PUBLISHING CO.

No. 25 West 45th Street, New York.

Telephone—Bryant 2876.

CABLE ADDRESS: IRWORLD, NEW YORK.

HENRY C. PEARSON, Editor

Vol. 53 MARCH 1, 1916 No. 6

SUBSCRIPTIONS: $3.00 per year, $1.75 for six months, postpaid, for the United States and dependencies and Mexico. To the Dominion of Canada and all other countries, $3.50 (or equivalent funds) per year, postpaid.

ADVERTISING: Rates will be made known on application.

REMITTANCES: Should always be made by bank draft or Postoffice or Express money order on New York, payable to THE INDIA RUBBER PUBLISHING COMPANY. Remittances for foreign subscriptions should be sent by International Postal Order, payable as above.

DISCONTINUANCES: Yearly orders for subscriptions and advertising are regarded as permanent, and after the first twelve months they will be discontinued only at the request of the subscriber or advertiser. Bills are rendered promptly at the beginning of each period, and thereby our patrons have due notice of continuance.

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Entered at the New York postoffice as mail matter of the second class.

TABLE OF CONTENTS ON LAST PAGE OF READING.

PREPAREDNESS AND THE RUBBER TRADE.

THE rubber manufacturers of the United States, through the action and intelligent work of the Preparedness Committee of the Rubber Club, are rapidly getting into line for a most vigorous and practical campaign. They have not been side-tracked by such questions as how many atomizers could be mobilized for hospital use in the event of war. They are driving straight at the mark, which is men, munitions, in fact, the real factors of national defense.

The first committee of four, Messrs. Price, Work, Mitchell and Colonel Townsend, has been expanded until it takes in all of the firm members of the Rubber Club.

President Firestone, ex-President Hodgman and Secretary Vorhis with the Preparedness Committee, are hard at work organizing a campaign that shall be so comprehensive, forceful and sane that it will appeal to every true American.

To quote from one of the big rubber companies: "The safety of America depends upon the part which the business world plays in the immediate future in achieving industrial mobilization, and assisting the government towards a more business-like administration."

THE AMERICAN RUBBER EXPORTS IN 1915.

THE year 1915 broke all records for American exports, the value of which amounted to $3,550,915,393, against $2,113,624,050 for 1914, and $2,484,018,292 for 1913. It is, however, hardly fair to judge the volume of the 1915 exports by their money value, as many of the products were sold at "war prices," materially in advance of those obtainable in normal times.

Exports of rubber goods in 1915 were made on an extensive scale according to official reports that have just come to hand. They amounted to $24,415,906, more than double those of 1914, and nearly double those of each of the three previous years. An examination of the statistics, published elsewhere in this issue, exhibits some interesting comparisons.

The increased exports of automobile tires in 1915 is really stupendous. During last year $11,415,481 worth was shipped, against $3,315,116 in 1914 and $3,910,688 in 1913. A comparison of the destination of these tires is interesting. England bought $6,689,584 worth against $1,458,777 the year previous; Canada received one-third more than in 1914 and Mexico and the Philippines twice as much. Tires valued at $920,542 were exported to Cuba and Australia in 1915. The statistics for 1914 show no exports of tires to these countries. In 1914 Germany and Belgium received $82,218 worth of tires, but none are shown for 1915. To other countries not enumerated the report shows exports of $2,165,112 in 1915 against $674,306 in 1914.

The above represent only automobile tires. Exports of all other tires, truck, motorcycle, bicycle, etc., in 1915, amounted to $1,995,319 or over four times that of the previous year.

Spectacular increase was also exhibited in rubber boots which were exported in 1915 to the value of $1,228,681, practically twice the 1914 value of $616,602, and more than four times that of 1913, when $282,598 represented the exports.

The value of rubber shoes slightly exceeded that of previous years, the exports being $1,475,697 in 1915, $1,402,503 in 1914 and $1,008,167 in 1913.

Belting, hose and packing were sent out in slightly reduced amounts. The comparative figures are: $2,012,556 in 1915, $2,098,506 in 1914 and $2,486,843 in 1913.

Under the classification of all "other rubber manufactures" in which druggists' sundries and insulated wire and cables play an important part, the exports in 1915 amounted to $5,100,959 against $3,016,098 in 1914 and $3,767,554 in 1913.

Scrap rubber exports show material losses. The exports for the year were $356,350, which is about $52,000 less than in 1914, and less than half as much as in 1913. Reclaimed rubber also exhibits a slight decrease, although during 1915 it was exported to the value of $830,836.

The statistics represent a condition that is exceedingly gratifying. Whether the high record of the present year will equal or exceed that of 1915, is yet to be determined. The countries to which the greatest amount of rubber goods was sent in 1915 are placing their factories in condition to supply more and more of their war requirements. Money in Europe is being spent less freely than a few months ago, and unless American rubber manufacturers make a strong effort to increase their export trade in markets other than European, it would not be surprising to see the 1916 figures smaller than those for 1915.

THE RUBBER CLUB'S NEW PRESIDENT.

THE rubber trade is to be congratulated upon the election of Harvey S. Firestone to the presidency of The Rubber Club of America, Inc. Heretofore, the chief executives of the association have been eastern men drawn from the rubber centers close to Boston or New York. Mr. Firestone comes from Akron, the greatest rubber city in the world. Accustomed to big things accomplished with the speed of magic, he is not likely to be too much hampered by precedent or controlled by convention.

He is also a self-made man who has known the day of small beginnings. He has fought his way upward, not by pulling others down, but by helping them up with him. Today, as the head of one of the great rubber companies, he is the same capable, friendly, unassuming gentleman that he was at the beginning.

A wonderful organizer, he has surrounded himself with young enthusiastic "live wires," and this same faculty is sure to be of value to the Rubber Club.

Finally, he is fortunate in having a breadth of view that is unusual. His pioneers long ago explored and reported upon the sources of wild and planted rubber in tropical America and the Far East, and have kept in touch ever since. When, therefore, the question of rubber preparedness really comes to the front, the head of the world's greatest rubber organization will be amply fitted to handle it.

Welcoming the new president should not lead to forgetfulness of the very capable gentleman whom he succeeds. For more than two years, Mr. Hodgman has lived with and for the Rubber Club. His concentrative attention to detail, his courtesy, his full appreciation of the work of others have left an impress for good upon the association that will not soon be effaced. None the less sincere because unspoken, he has the confidence and thanks of the whole trade.

CRUDE RUBBER DISTRIBUTION.

BASED on the estimates of the distribution of crude rubber that appeared in our February issue, a comparison between 1915, a war year, and 1913, a peace year, shows some very interesting facts.

England in 1915 received 33⅓ per cent more rubber than in 1913, Germany and Austria 82 per cent less and France 22 per cent less. Russia showed an increase of 39 per cent and the United States and Canada together gained 90 per cent. The world's total crop in 1915 was 38 per cent larger than in 1913, a most satisfactory increase.

Statistics are very useful as an aid in determining probabilities if all important factors are obtainable. If not, deductions made are not only useless, but sometimes lead to absurd conclusions. For example, suppose one should take the percentages of increase or decrease above as a means for calculating the distribution of rubber in 1925.

Figured thus, England would consume over 100,000 tons of crude rubber. Germany and Austria, by the same process, would distribute two-thirds of a ton between them, and France's apportionment would be 2,000 tons. Russia would get about 80,000 tons, Italy, 50,000 tons, and 128,000 tons would be divided between Japan and Australia. The United States and Canada, by the same reasoning, would obtain 2,216,000 tons, about 25 times the 1915 receipts.

The percentage of increase in plantation and wild rubber for the two years shown above is 38 per cent, which would give for a world product in 1925 (perhaps) 730,000

tons, or less than one-third of the total which the United States and Canada together are estimated to receive. *Reductio ad absurdum.*

THE PROPOSED TARIFF COMMISSION.

TARIFFS up to this time, with the exception of the Act of 1883, have been the work of the Ways and Means Committee of the House of Representatives, assisted in a greater or less degree by business men. Then going to the Senate, these measures were recast and often greatly changed by its Finance Committee. Finally, a conference committee of the two bodies made additional revisions and compromises so that the bill could receive the approval of Congress. The resulting measures have generally been inadequate, unbalanced, and abounding in incongruities that brought justice to neither manufacturer nor consumer.

During the past few years a strong movement has developed to take the tariff out of politics. Business men and some politicians have concluded that more deliberate and exact knowledge was requisite for the proper enactment of future tariff legislation. The war has brought home the realization that, when peace is again declared, prompt measures will be needed to meet the changed conditions and to properly guard the interests of American producers.

With the approval of President Wilson, Representative Rainey of Illinois, the ranking Democratic member of the Ways and Means Committee of the House, has introduced a bill providing for a commission of five members, not more than three of whom shall be of the same political party. This measure, which the best opinion in Washington expect will become a law before the end of the present session, gives broad powers for the investigation of customs laws and their effects and on all questions relating to tariffs, with a view to arrangement of schedules. Commercial treaties, statistics, and unfair foreign competition are among other subjects to be looked into.

The unusual powers of examination and investigation, as proposed in this bill, have rightly met with some criticism, such as, "The right to copy any documentary evidence of any person * * * engaged in the production, importation or distribution of any article under investigation * * * and to require any person * * * to produce books or papers." The production of documentary evidence and the attendance of witnesses under the terms of the bill may be required "from any place in the United States to any designated place of hearing." Penalties are provided to enforce compliance.

Manufacturers of rubber goods, like those in other lines, will not endorse the features of this bill that make attendance at hearings compulsory and that require the opening of their books to the commission whenever demanded. They will, however, be glad to have the next tariff adjustment made on an intelligent and scientific basis.

The creation of a permanent tariff commission is a step in the right direction. Some day, perhaps, its powers will be extended to the fixing of tariff rates, somewhat in the way that the Interstate Commerce Commission determines transportation charges. Then the tariff commission, if judiciously conducted, should prove a power for developing an increased national prosperity and would prevent the unfortunate business slumps that usually accompany tariff revisions.

THE GOLF BALL.

THE golf ball as used for centuries was made of feathers compressed within a leather case. Then for a few decades solid gutta balls were generally used. They were good, but better were demanded, and America supplied the need.

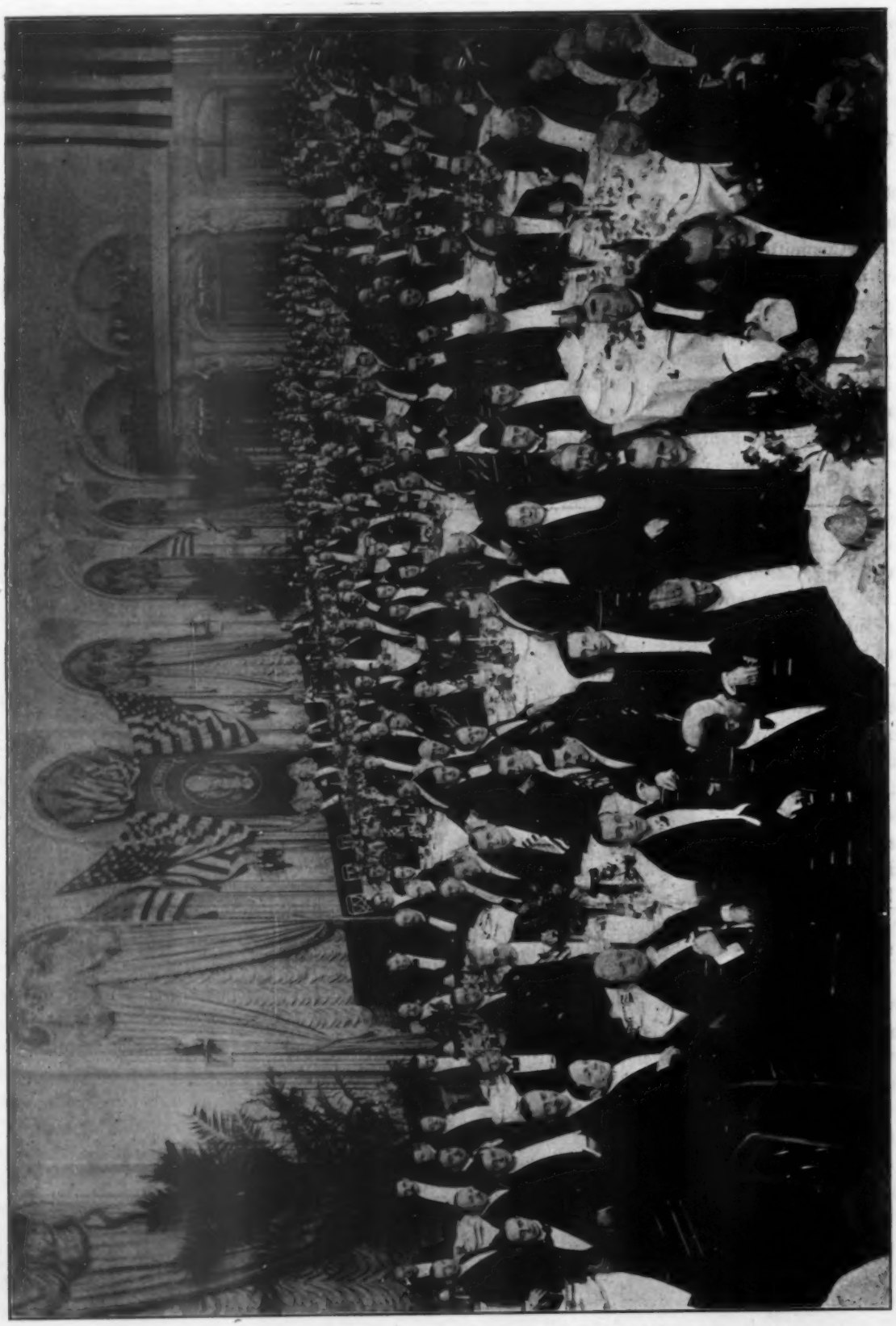
The feather ball had a peculiar slow resilience that helped to secure long flight; the gutta had a better slow rebound; but the stretched rubber threads of the "Haskell" gave a slow resilience, better than that of its predecessors.

The Haskell patent expires next month and this country is threatened with an invasion of English-made balls. How seriously this will interfere with the American product is a question.

When the Haskell ball was invented, there was comparatively little golf played here. Now, Jerome D. Travers, the national open golf champion, estimates there are 1,300 golf clubs in the United States with a combined membership of 350,000. He says that the average player spends $20 a year for balls—a total of $7,000,000.

Assuming that the average golf ball costs 50 cents, 14,000,000 balls are required annually to supply American players alone. And golf is becoming more and more popular every year.

The amount of tire scrap is increasing—183,000 tons of casings and tubes are estimated for the United States this year.



Sixteenth Annual Banquet of The Rubber Club of America, Inc., at the Waldorf-Astoria, February 2, 1916.

The Rubber Club's Sixteenth Annual Banquet.

"PREPAREDNESS" was the keynote of the gathering, the talk of the diners and the principal topic of the excellent after-dinner speakers at the sixteenth annual banquet of The Rubber Club of America, Inc., which was held in the Myrtle Room of the Waldorf-Astoria, New York City, on Wednesday evening, February 2.

Most of the same leaders in the rubber industry who have attended the previous dinners were present, but the number of diners was increased to 288, nearly 100 more than assembled in the same place in 1914. Many of the members had come from long distances to attend the function, whose influence was to weld closer friendships and promote mutual good will.

The diners met in a reception room and many reunions of friends were witnessed before the banquet was served. On entering the banquet hall, decorated with American flags, the guests found at each place souvenirs in the form of a silk American flag and a silver pencil, and also an attractive programme and menu on the front of which was handsomely embossed an American flag.

After an invocation by the Rev. George R. Van De Water, D. D., the diners enjoyed an excellent repast and enthusiastically participated in popular and patriotic songs.

TOASTS TO THE DEFENDERS.

After the dinner Ex-President Hodgman proposed three toasts: one to the President of the United States, another to "our first line of defense, the United States Navy," and the third to "our next line of service, small but willing to grow, the United States Army." These were drunk with much enthusiasm amid great applause.

He then read a cablegram of kindly greeting and good wishes from the chairman and council of the Rubber Growers' Association and a telegram from Dudley Field Malone, collector of the Port of New York, regretting that official business had called him from the city.

MR. HODGMAN'S ADDRESS.

Ex-President Hodgman continued with the following address to the assembly:

GEORGE B. HODGMAN,
Ex-President.

Since our last banquet two years ago, history has been in the making at a rapid rate, more so than ever before in the memory of man. When we met together before, the whole world was at peace; now over one-half of it is plunged in war.

In these days of the supposedly higher civilization, it almost seems impossible that this should be, but we have evidence on every side that it is only too true, and our own country, although remote from the scene of actual hostilities, cannot but feel the influence of the conflict which is raging on the other side of the earth.

Our own industry, like many others, has been affected, for we have seen during the past 18 months practically all of the raw materials which enter into the manufacture of our products increase in price, some to an unprecedented degree, and there have been times when the uncertainty of procuring the necessary supplies to run our mills has been very acute.

This all goes to prove that, in spite of the immense resources of the United States, there are industries, such as ours, which are entirely dependent upon foreign sources for the essentials which enable us to make our livelihood. While this is a situation which in the nature of things cannot be remedied, it certainly furnishes much food for thought.

In the crisis which arose in the latter part of 1914, when it seemed possible that we might be deprived of the greater part of our supply of crude rubber, because of the activities of the Rubber Club of America this peril was averted, which clearly shows that an organization such as ours is a real necessity, and not only in a crisis like this, but in many other ways can serve and foster the industry which we represent.

While the United States has been, and we fervently hope will remain, at peace, yet we cannot but give serious attention to the lessons which the great conflict in Europe has taught us. To the vast majority of the people, two years ago, the thought of such a war was impossible, almost unbelievable, but nevertheless the war *did* come, and has developed into the most stupendous conflict of the ages. As the unbelievable has once happened, who can now predict that it may not happen again, and some time involve this fair land of ours?

With these facts before us, it behooves us as a nation to awaken, and place ourselves where we will be able with full confidence adequately to defend ourselves against a foreign attack, and not subject ourselves to the humiliation which in our present defenseless condition would be inevitable.

I, therefore, fervently hope that the patriotism, which has shown itself in crises in the past, may rise again to the same lofty heights, and that we as a people, irrespective of party or creed, may make it our absorbing purpose to let nothing stand in the way of preparing ourselves to defend our country and our flag against the worst that may come.

In this worthy cause the rubber industry of the United States should do its part, and I trust that the action taken

MENU

"Some has meat who cannot eat,
Some need eat who need it,
But we has meat, and we can eat,
And so the Lord be thanked."—BURNS.

Smith Island Oyster. Clysmic

"Oysters is like all other human beins'—some is good and some of 'em is bad."—ARTEMUS.

Cream of Celery aux croutons

Radishes Olives Celery Almonds

"To blow and swallow at the same time is not easy to be done."—PLAUTUS.

Medaillon of Sea Bass, à la Joinville
Cucumber Salad, French Dressing

"Fishes live in the sea as men do a-land; the great ones eat up the little ones."—SHAKESPEARE.

Fresh Mushrooms under Glass Graves Superieur

"Can we ever have too much of a good thing?"—CERVANTES.

Mignon of Lamb, Colbert Sauce

Potatoes Lauretta String Beans sautè

"The discovery of a new dish does more for the happiness of a man than the discovery of a new star."—BRILLAT SAVARIN

Grapefruit Maraschino

"A morsel for a Monarch."—SHAKESPEARE.

Roasted Philadelphia Squabs on Toast
Hearts of Lettuce, Russian Style

"Everybody is getting roasted nowadays, why not a 'squab' also?"

Bombe of Chestnuts glacée

"Then farewell heat and welcome frost."—MERCHANT OF VENICE.

Assorted Cakes

"I am glad that my Admiral has a sweet tooth in his head."—LYLY.

Coffee

"Coffee—how indefinite a word! It means so much or so little!"

Cigars Cigarettes Rossdown Grand Vin Sec

RECESSIONAL

"Good night. My grief lies onward and my joy behind."—SHAKESPEARE.
"Now I drink with water and not with wine."—BEN JONSON.

at our annual meeting this afternoon will merit the hearty approval and receive the enthusiastic support of our membership.

Although this is a social and not a business occasion, I wish at this time to extend my appreciation for the cordial support which has aided me during my term as president of the Rubber Club of America. I bespeak for your new president the same cooperation and consideration which you have given me.

Many of the attempts to regulate our business affairs by Congress, during the past decade, have been based upon theory rather than on facts. The Federal Trade Commission is making a serious effort to secure actual facts concerning business on which intelligent legislation may be based, and at the same time is in position to advise the manufacturer or merchant on any proposed action which might be open to question.

EDWARD N. HURLEY ON THE FEDERAL TRADE COMMISSION.

Edward N. Hurley, vice-chairman of the Federal Trade Commission, after calling attention to the fact that the Rubber Club, as a strong and active organization, had grasped the modern idea of collective business effort, told of ways in which the commission hoped to assist American industries. Then, speaking regarding the conditions in manufacturing industries he said, in part:

Photo by Moffett.
HON. EDWARD N. HURLEY.

In a brief survey which we made of a typical manufacturing industry, which is well and favorably known and sells its product in every state in the Union, figures received, covering the year 1914, showed that 27 of the larger manufacturers, all shipping over $100,000 worth of goods a year, with an aggregate capital stock of $9,000,000, bonds and other indebtedness of $3,500,000, and total sales of $8,500,000, had a net income of only $300,000, which is three and one-third per cent on the capital stock, or three and one-half per cent on the sales. This does not indicate a very profitable business.

The most striking feature which appeared, however, was the fact that these concerns, with a total investment of about twelve and a half million dollars, and net sales of eight and a half millions, charged off only $69,000 for depreciation. Furthermore, this amount was charged off by 12 of the 27 concerns, which represented an investment of four and a half million dollars and sales of four million dollars. The other 15 concerns, with an investment of eight million dollars and sales of four and a half million dollars, did not charge off one penny for depreciation. This example is typical of other industries. Similar conditions have existed in many lines for years.

Leaving out of consideration the banking, railroad and public utilities corporations, and referring only to those that have to do with trade and industry, we find that there are about 250,000 business corporations in the country. The astonishing thing is that over 100,000 of these report no net income whatever. In addition 90,000 make less than $5,000 a year, while only the 60,000 remaining, the more successful ones, make $5,000 a year and over.

In tabulating the data for the large and successful corporations in the United States, comprising all the corporations doing a business of $100,000 a year or over, we found that, out of a total of 66,000, 30,000 charged off no depreciation whatever.

How can the Federal Trade Commission help to improve conditions?

The Commission has no intention and no desire to use compulsory methods. But it does hope to reach the desired end by encouraging improvements in accounting practice, by indorsing standard systems of bookkeeping and cost accounting, and by assisting in devising standard systems, either at the request of individual merchants and manufacturers or through the association that represents the industry.

We must get down to the hard facts of business, to learn precisely what they are, where the weakness and losses exist, and practice the same thoroughness which characterizes trade and industry in Europe. We must be improving our methods of production, changing our designs to meet the new conditions both at home and abroad, and always endeavoring to adopt some new method that will reduce the cost of operation. We also need to standardize our products and processes.

In Germany every important industry is organized into trade associations and 85 per cent. of the manufacturers engaged in those industries are represented in their respective trade associations. More than 600 independent associations of manufacturers, producers and merchants exist in Germany today and besides the entire industrial system of that country is honey-combed with about 5,000 subsidiary business organizations.

The war has brought to us great opportunities and equally great dangers. The thought that we must keep in mind is: "After the war, what?" Shall we grow and expand while the growing is good, or calmly wait the time when peace in Europe will be followed immediately by keen competition not only in foreign markets, but in our domestic markets as well?

Let us seek better organization and greater efficiency at home; let us push our trade abroad; let us develop our industry so strongly that no foreign competition can dislodge it. Industrial preparedness must be our watch-word.

(C) Underwood & Underwood.
HENRY D. ESTABROOK.

HENRY D. ESTABROOK ON PREPAREDNESS.

Henry D. Estabrook, of New York, was introduced and made a strong and eloquent plea for preparedness, extracts from which follow:

I would rather scrap every gun and warship we own, if we are not going to add to them, for if we were without strength to repel invasion, we could at least plead the privilege of the weak and surrender with discretion, and rely on the moral claim on the part of the invader, but to fight half-armed and with a certainty of losing would be nothing short of murder for which you and I and every taxpayer in the United States would be measurably responsible.

We are admitted no alternative. We must spend money for defense forthwith, and lots of it. We must know we are safe even from the temptation of attack. Our peace and future happiness depends upon it.

"To prepare for war," said Washington, "is one of the most effective ways of preserving peace. A free people should not only be armed, but disciplined. To that end a uniform and well digested plan is requisite."

This plan should come from our military experts. In so far as their recommendations were unanimous, they should be adopted without much debate, and regardless of cost, with the understanding always that the sole purpose to be subserved is defense and not aggression.

This obviously means a big navy, as big as any navy in the world, with every flying, diving, amphibious auxiliary that can add to it. It means ammunition to boot, ammunition, at least, for a year's campaign always in cold storage. It means enough officers and men easily to operate the machinery of the government. And, inasmuch as this machinery will be complicated and scientific, it means officers and men of technical training and brains. Men like these can always obtain lucrative employment in civil lines. The government must outbid that market.

Insurance costs money. America has more things of value to insure, and more money to pay the premium than any nation in the world.

There is no better auxiliary to a navy than a merchant marine, nor is there any instrumentality that adds more to the riches and glory of a nation. Time was when our flag covered the seven seas; when the ocean highways, costing nothing for repairs, were as much ours as England's.

The government cannot compel Americans to build ships. The government can only tempt and coax them. The cheapest encouragement it can offer is to permit them to compete on an even keel with the shipowners of the world. If to do this involves subsidies, then the government must equalize conditions or go without the ships.

REV. W. WARREN GILES.

THE REV. MR. GILES PROVOKED MUCH GOOD HUMOR.

The Rev. W. Warren Giles, of East Orange, New Jersey, who has the well earned reputation of being one of the most entertaining after-dinner speakers in the country, followed Mr. Estabrook with an address full of rare wit and humor intermingled with serious and thoughtful appeals for adequate preparedness. Referring to this subject, he said:

It is foreign invasion that I am afraid of, and I do not know of anything to prevent it, that I have seen on this side of the ocean, as yet. Certainly not an army of fifty thousand men, certainly not millions of men who do not know a quick-firing gun from a ton of coal. We have some good soldiers, we have had some good soldiers sometimes, but they are not good soldiers tonight.

The thing that burdens me more than anything else today is our loss of chivalry. As a nation we have no national ideals. Over in Germany they are all Germans; in France, all French; if you go into Canada tonight you won't find a thing but Canadians; and less than nine millions are able to raise an army of five hundred thousand men; and you may be assured they are good soldiers.

But in this country tonight we have Anglo-Americans, and German-Americans, and we have French-Americans, and Italian-Americans, and every one of them has a point of view of his own. If we are going to face the future with a spirit of preparation that is effective, we have to unite on America for Americans.

HON. HARRY M. DAUGHERTY.

HON. HARRY M. DAUGHERTY ON COMMERCIAL PREPAREDNESS.

The Hon. Harry M. Daugherty, of Columbus, Ohio, was introduced by Ex-President Hodgman as standing for "bread, butter and business; also for peace, protection and prosperity." Mr. Daugherty called attention to the fact that during recent years envy, avarice and suspicion had grown throughout the world. After a broad review of the political situation, he said:

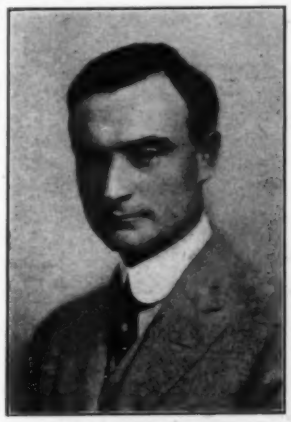
Coming from Ohio and seeing here tonight men who come from my proud state, I can say to you that Ohio is in favor of an ample preparedness, of the establishment of a merchant marine, and in lending governmental aid and assistance to the construction of utilities upon the oceans that will carry American trade to every market in the world.

We are in favor of enacting such laws as will take care of the situation in this country industrially when this war is over, of protecting America and American capital and American labor.

I do not tonight have any fear of an attack upon us, yet to avoid any attack I believe in preparedness, but when this war is over, the invasion that we had better look after is the industrial invasion. Every soldier on the battlefield and in the trenches in this war, when he returns to his devastated country, will go into the mills and shops and work for wages lower than he ever worked for before and the foreign manufacturer will be willing to sell cheaper than he ever sold before, and ours, excepting his own home market, will be the greatest market in the world. We will have the money, and this is the market they will invade.

MAYOR MITCHEL IS FOR A CITIZEN RESERVE.

John Purroy Mitchel, mayor of New York City, the next speaker, pointed out that regardless of how high the devotion of a people for peace or how high a nation stands for justice, that it is a fundamental duty of every citizen to take such steps as will secure peace and perpetuate the institutions that have been built up. He then made a strong plea for preparedness, in which he said in part:



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HON. JOHN PURROY MITCHEL.

We want defenses. We want an adequate navy, and an effective citizen reserve out of which we can constitute a mobile army not to make war, but to prevent war. We want to make ourselves so potentially formidable to any nation and to all nations that no nation will seek a quarrel with us.

With the seaboard that we have to defend, with the commercial interests that are now fast growing, with the commercial relations that will exist when the war in Europe is over, when that commercial warfare comes that is inevitable, we should have as a means of defending American interests at home and abroad a navy that will be second to that of no other nation.

However good our navy, however effective our coast defenses, every military and naval expert will tell you that we must have at least the material out of which an effective mobile army can be made within a reasonably short period of time. That material does not exist today. We have the barest nucleus of a standing army. We have at the utmost, with standing army and militia combined, not more than ninety thousand effective troops who could be put in the field today, and behind that today there is no citizen reserve. We ought to have federal control over the national guard.

CAPTAIN ERNEST E. BUCKLETON.

We ought to have a citizen reserve made up of all the male citizens of the United States, within reasonable age limits, trained to the use of arms. That means neither militarism nor a great standing army, but the realization of the American ideal of a citizenship capable of bearing arms in case of need.

CAPTAIN BUCKLETON ON THE BELGIAN CONTRIBUTION.

Captain Ernest E. Buckleton, president of the Northwestern Rubber Co., Liverpool, England, who was relieved from service at the front when injured by the explosion of a mine, was asked by the toastmaster to speak. Referring to the contribution made last year by the Rubber Club for the Belgian refugees, he said:

I would like to take this opportunity first of expressing to you the thanks of the Belgian refugees in Liverpool for the magnificent gift which the members of this Club, collectively and individually, sent to me last year to be used on their behalf.

There are a great many of you perhaps that do not know

that a number of refugees came to Liverpool, and when I was over here in 1914, I made a remark to Mr. Pearson, of THE INDIA RUBBER WORLD, that it was my intention to do what I could for them. He took up the matter with the members and they made a most generous gift, which I can assure you has been thoroughly appreciated by those poor refugees. It has enabled me with the help of a great many other friends to take care of 30 or 40 women and children of the best class of Belgium who were forced to come to England on account of the war in their country.

THE "GAS MASK."

I am only a rubber manufacturer, but the rubber industry has enabled the world to help the unfortunate soldiers at the front, who are fighting today for what each one considers his duty and his right.

Photo Underwood & Underwood.

THE RUBBER GAS MASK.

The mask (shown in the accompanying illustration) is used to neutralize the chlorine gas used by the Germans in their attacks. They have it stored in large cylinders and at a favorable opportunity this gas is discharged and comes along in a low cloud. Immediately the discharge takes place, every soldier immediately puts on his helmet and he lives with it. He is never in the trenches without it. Perhaps the most curious sight in the world is to see a battalion with these helmets on.

The rubber industry is to be congratulated in being able to produce something which has saved the lives of thousands and thousands of men.

THE MEMBERS AND GUESTS PRESENT.

At the President's Table.

Daugherty, Hon. Harry M.
Estabrook, Henry D.
Giles, Rev. W. Warren
Hodgman, George B.
Hurley, Hon. Edward N.
Mitchel, Hon. John Purroy
Pinheiro, Hon. H. C. De M.
Pratt, Dr. E. E.
Usher, Rear-Admiral N. R.
Van De Water, Rev. Dr. G. R.

Alphabetical List.

A

Achelis, F. G.
Allen, W. R.
Anderson, E. A.
Anderson, F. C.
Arnold, C. H.
Arnold, W. H.
Ashcroft, R. W.
Austin, F. G.

B

Babcock, F. H.
Bachman, R. A.
Badenhop, Robert
Bainbridge, W. T.
Baird, R. B.
Baird, R. L.
Baird, William T.
Barker, William E.
Barnard, H. H.
Barnard, Orin A.
Barnes, Charles W.
Bass, Walter H.
Bass, William F.
Bassett, Theodore W.
Basten, Otto
Bechton, H. W.
Bedell, Harold H.
Belchen, Edwin W.
Bers, Aaron
Blackwell, Wilson H.
Bourn, A. O.
Bourn, A. O., Jr.
Bowman, W. P.
Boyer, H. L.
Braender, Fred
Brinckerhoff, E. A.
Broadhead, Garrett, Jr.
Broadwell, E. H.
Broughton, J. S.
Brown, Andrew H.
Brown, William Harman, Jr.
Bruyn, William E.
Bryant, George G.
Buckleton, Captain E. E.
Byles, W. E.

C

Caldwell, R. J.
Campbell, Phillip H.
Candee, Charles N.
Carberry, John D.
Cartmell, Van H.
Case, C. C.
Chandler, John J.
Chichester, Ira
Chipman, R. L.
Clark, M. H.
Clyden, A. L.
Cobb, J. H.
Coe, C. A.
Cole, William T.
Coleman, T. L.
Conant, Richard G.
Cone, Charles A.
Cone, Frederick H.
Conlin, A. J.
Cornell, A. Boyd
Cottle, George
Coughlin, E. J.
Coughlin, Thomas
Coughlin, T. B.
Cummings, E. O.
Cummings, H. H.

D

Daugherty, Hon. H. M.
Davis, J. Edwin
Davol, Charles J.
Devine, Charles F.
Devine, Joseph P.
Dickerson, W. H.
Dickinson, F. S.
Dickson, F. S.
Dodds, Samuel H.
Dreckmeier, F. W. L.
Drisler, W. A.
Dumont, L. W.
Dunsford, S.
Duryea, A. R.

E

Eagles, R. P. M.
Estabrook, Henry D.

F

Faber, Eberhard
Faber, Lothar W.
Feinburg, D.
Fera, Henry, Jr.
Fields, John J.
Fields, John J., 3d
Fields, Richard K.
Firestone, Harvey S.
Fisk, H. G.
Fox, F. F.
Francis, Arnold W.
Fulkert, Charles
Fuller, H. P.
Fulper, E. B.
Funk, A. S.

G

Gardner, George A.
Gardner, T. M.
Garretson, C. D.
Garthwaite, O. A.
Gaskill, J. W.
Giles, James F.
Giles, Rev. W. Warren
Greene, N. Lincoln
Greenough, A. B.
Grieb, William G.
Goldman, H.
Grosscup, Judge P. S.
Gunn, J. Newton

H

Hall, George E.
Harrison, Clark
Haynes, Charles R.
Henderson, B. W.
Henderson, F. R.
Hering, H. F.
Hewins, E. D.
Hichborn, George F.
Himebaugh, L. C.
Hodgman, George B.
Hodgman, S. Theodore
Holcombe, H. W.
Hood, Frederic C.
Hopkinson, E. B.
Hotchkiss, H. Stuart
Hubbard, H. B.
Huber, Edward E.
Hunter, Joseph H.
Hurley, Hon. Edward N.
Hutton, Wallace
Hydes, Thomas
Hopper, C. C.

J

Jacoby, Ernest
Jeandheur, George E.
Jenkins, H. W.
Johnson, Allen F.
Johnstone, James T.
Jones, Frederick H.

K

Kearns, John
Kelly, J. H.
Kelly, W. J.
Kelly, Dr. W. J.
Kent, R. W.
Kenyon, C., Jr.
Kenyon, George
Kittle, F. L.
Koehn, Alfred C.
Korn, E. A.

L

LaDow, Jesse E.
Lahey, Frank
Lambert, J. A.
Laurie, J.
La Mont, F., Jr.
Lamont, Sloan, Jr.
Lewis, George W.
L'Hommedieu, S. Y.
Litchfield, P. W.
Littlejohn, Robert M.
Logan, William V.
Lowman, J. S.
Ludington, George A.
Lynch, Charles

M

McCallum, Fred
McGraw, R. W.
McKay, C. B.
McKenna, Drew
McLean, Joseph F.
MacKusick, H. A.
MacMichael, L. P.
Macomb, J. W.
Manchester, A. A., Jr.
Marcus, A.
Marshall, Thomas C.
Marland, W. H.
Martin, B. T.
Maurer, Edward
Maurer, Edward J.
Mayo, George H.

Meyer, Adolph
Meyer, Otto
Meyers, A. C.
Meyers, Sidney S.
Miley, C. E.
Miller, Joseph A.
Mitchel, Hon. John Purroy
Montgomery, Henry
Morgan, John
Morse, William M.
Muehlstein, Herman
Muehlstein, J.
Murray, James A.
Myers, F. E.

N

Naylor, R. H.
Neil, Edwin M.
Newcombe, Richard S.

O

Odell, James E.
Owens, R. J.
Oakley, C. H.
Obalski, X. W.

P

Page, Wallace G.
Park, Edgar
Parker, J. R.
Parker, Russell
Parsons, W. Guy
Pearce, H. C.
Pearson, Henry C.
Pell, George E.
Perlish, Henry
Pfeiffer, William
Pinheiro, Hon. H. C. De M.
Pitcher, W. L.
Place, Charles A.
Place, Charles H.
Plumb, L. J.
Pratt, Archer
Pratt, Dr. E. E.
Price, R. B.
Proctor, L. B.
Procter, William L.
Pusinelli, Fred

R

Rector, Dr. Joseph M.
Reed, Henry D.
Rice, R. L.
Robinson, Thomas L.
Robertson, J. G.
Roebling, K. G.
Rutherford, W. O.
Ryckman, W. G.
Roe, Mark W.
Reeve, Arthur

S

Sachs, Adolph R.
Sachs, Robert Paul
Sawyer, Homer E.
Schieren, G. Arthur
Schwab, F. M.
Seward, T. J.
Shreve, J. Nelson
Skinner, J.
Smith, A. W.
Smith, Herman E.
Smith, H. W.
Smith, P. G.
Smith, R. G.
Spencer, R. F.
Stearn, E. W.
Stiles, Lynn D.
Stiles, William H.
Stephens, William
Stokes, Charles E.
Stokes, R. J.
Sweeney, E. C., Jr.

T

Talen, F. A.
Thalhimer, Albert F.
Thomas, J. W.
Thomas, L. H.
Thompson, Kennedy M.
Taylor, M. C.
Tweedy, O. S.
Ticknor, W. D.

U

Usher, Rear Admiral N. R.

V

Van Alst, Milton
Vance, L. T.
Van Cleve, George B.
Van Der Beck, Frank A.
Van De Water, Rev. Dr. G. R.
Van Etten, J. D. C.
Van Kleeck, Chester
Vincent, R. W.
Von Schleggel, V.
Voorhees, Frank D.
Vorhis, H. S.

W

Warren, A. W.
Watkinson, George
Weida, H.
Weitling, William W.
Welton, Spencer
Whitehead, Alfred
Whitehead, Richard R.
Whitenack, W. A.
Whittelsey, Dr. T.
Weis, George A.
Williams, Elisha S.
Wilson, Charles T.
Wood, Charles E.
Woodard, S. P.
Woodbury, R. B.
Woodward, F. R.
Wright, Samuel

Y

Young, Philip E.
Yule, W. H.

RETIRING EXECUTIVE COMMITTEE AND DIRECTORS MEET.

On February 1 a meeting of the executive committee of the Rubber Club was held at the Union League Club, New York City, with the following members present: President, George B. Hodgman; Frederic C. Hood, Henry Spadone, William E. Bruyn and Van H. Cartmell. Raymond B. Price, chairman of the temporary committee on preparedness, the other members of which were Bertram G. Work, Colonel Arthur F. Townsend and John K. Mitchell, rendered an interesting report.

The committee then met with the board of directors, the following being present at at this meeting: Augustus O. Bourn, William E. Bruyn, Harry G. Fisk, George E. Hall, George B. Hodgman, Frederick H. Jones, William J. Kelly, Henry C. Pearson, Henry Spadone and Elisha S. Williams.

MEETING OF RUBBER SUNDRIES MANUFACTURERS' DIVISION.

The Rubber Sundries Manufacturers' Division of The Rubber Club of America, Inc., on February 2 held its annual meeting at the Waldorf-Astoria and re-elected the following officers for the ensuing year: Russell Parker, Parker, Stearns & Co., chairman; Charles J. Davol, Davol Rubber Co., vice-chairman; Harry S. Vorhis, secretary and treasurer. The members of the executive committee of this division are as follows: Russell Parker, chairman; Charles J. Davol; George B. Hodgman, Hodgman Rubber Co.; W. O. Rutherford, The B. F. Goodrich Co.; Frederick H. Jones, Tyer Rubber Co.; A. C. Eggers, Goodyear's India Rubber Glove Manufacturing Co.; E. E. Huber, Eberhard Faber.

MEETING OF MECHANICAL RUBBER GOODS MANUFACTURERS' DIVISION.

The Mechanical Rubber Goods Manufacturers' Division held its meeting on February 2 at the Waldorf-Astoria, and re-elected the following officers: William T. Cole, Fabric Fire Hose Co., chairman; John J. Voorhees, Voorhees Rubber Manufacturing Co., vice-chairman; Harry S. Vorhis, secretary and treasurer. The executive committee membership is as follows: William T. Cole, chairman; C. C. Case, Revere Rubber Co.; George E. Hall, Boston Woven Hose & Rubber Co.; J. H. Kelly, Republic Rubber Co.; C. Edward Murray, Empire Rubber & Tire Co.; W. O. Rutherford, The B. F. Goodrich Co.; Henry Spadone, Gutta Percha & Rubber Manufacturing Co.; John J. Voorhees; George A. Wies, Eureka Fire Hose Manufacturing Co.

THE RUBBER CLUB GAINS MANY MEMBERS.

ANNOUNCEMENT has been made of material increase in membership of The Rubber Club of America, Inc. The firms together with the firm representatives are given below:

FIRM MEMBERS

Akron Rubber Mold & Machine Co., 917 Sweitzer avenue, Akron, Ohio; S. W. Harris.
Alden, Frank G., 29 Broadway, New York City.
Asbestos & Rubber Works of America, 1790 Broadway, New York City; Edward H. Garcin.
Batavia Rubber Co., Batavia, New York; W. P. Berrien or A. W. Caney.
Boston Yarn Co., 60 Federal street, Boston, Massachusetts; A. B. Greenough.
British-American Manufacturing Co., Springdale, Connecticut; L. C. Himebaugh.
Delion Tire & Rubber Co., Trenton, New Jersey; H. H. Coleman.
India Rubber Co., New Brunswick, New Jersey; Raymond B. Price.
Otto Isenstein & Co., 90 Wall street, New York City; Otto Isenstein.
LaCrosse Rubber Mills Co., LaCrosse, Wisconsin; A. S. Funk.
Mexican Crude Rubber Co., 625 Penobscot Building, Detroit, Michigan; Walter E. Parker.
National Rubber Co., 284 Hanover street, Pottstown, Pennsylvania; J. G. Feist.
Pharis Tire & Rubber Co., West Main street, Newark, Ohio; Carl Pharis.
Swinehart Tire & Rubber Co., 21 West North street, Akron, Ohio; Thomas F. Walsh.
Taylor, Armitage & Co., 346 Broadway, New York City; R. P. M. Eagles.
Werner & Pfleiderer Co., 41 Park Row, New York City; F. H. Banbury.
Winter Son & Co., 64 Wall street, New York City; Arthur E. Winter.

ASSOCIATE MEMBERS

Parker R. Browne, Boston Rubber Shoe Co., Malden, Massachusetts.
Frank L. Slazenger, 12 East 43d street, New York City.
Alpheus W. Smith, 819 Royal Insurance Building, Chicago, Ill.
W. B. Stewart, Allcock Manufacturing Co., 274 Canal street, New York City.
Samuel Wright, 706 Fayette street, Conshohocken, Pennsylvania.

The Annual Meeting of The Rubber Club of America, Inc.

THE annual meeting of The Rubber Club of America, Inc., was held on February 2 in the Myrtle Room of the Waldorf-Astoria, New York City.

After the reading of the minutes of the previous meeting, President George B. Hodgman presented the following interesting report, in which the activities of the club are described in detail:

REPORT OF THE PRESIDENT.

At the end of my term as your president, I submit for your consideration the official report due from me, as a mere outline of the accomplishments of your organization.

To your Board of Directors, to your Executive Committee and to the Rubber Control Committee is especial credit due for what you may find of merit in the transaction of the past year, such as increasing membership benefits, broadening the scope and work of the organization, and adding to its prestige and standing in trade circles. In this work you have had the gratuitous services of responsible men of affairs, singularly disinterested in their efforts to advance this organization to a position of dignity and worth in the commercial world. Since the last annual meeting of the Rubber Club, on April 21, 1914 (as our meeting of 1915 was omitted owing to the radical changes in our organization), the story of our progress is replete with interest.

Rubber Embargo:—The most important event during this period was the placing of the embargo by Great Britain on plantation rubber produced in her colonies. This unforeseen and sudden action brought consternation to our manufacturers, who saw before them the possibility of crude rubber supplies being so materially reduced that serious hardship would be imposed upon the industry, and in the light of subsequent events, to which I shall only briefly refer, the necessity and worth of your organization was proven.

Following the embargo, your Executive Committee appointed a committee of four, consisting of A. H. Marks, W. E. Bruyn, H. Stuart Hotchkiss and myself, to whom was delegated the task of endeavoring to find some means to alleviate the situation. This committee made frequent visits to Washington, covering a period of two months, and there made dignified representations to the State Department and to the British Embassy, and also co-operated with the Rubber Trade Association of London. B. G. Work also made a special trip to England, as a representative of the Rubber Club of America.

In the month of January, 1915, Great Britain raised the embargo on rubber, but because of the war, her necessities and her control of the situation, she dictated and imposed the conditions under which manufacturers were to secure their supplies. She devised a system whereby permits were issued in London for the shipment of rubber to the United States, consigned to the British Consul-General in New York, where such shipments were only to be released in consideration of the manufacturers and importers giving individual guarantees binding themselves not to export crude rubber, or manufactured, or partly manufactured rubber goods to the enemies of Great Britain, and also binding themselves to observe other requirements in respect to the shipments of manufactured goods to other countries.

The details necessary for the recording of guarantees and tracing the shipments covered thereby were found to be of such a cumbersome nature that the British Consul-General at New York requested the Rubber Club of America to assist him in the handling of this matter. Accordingly, and with the acceptance of this work by your association, it was deemed necessary to enlarge our facilities to meet increasing activities. We therefore moved from our small quarters, at 17 Madison avenue, to 17 Battery place, where we have an office sufficient in size and a clerical force sufficient in number to handle the great volume of business. Your Board of Directors also deemed it advisable to constitute and appoint a committee whose duties would be to keep in touch with this work and to assist in clearing any possible misinterpretations of the letter and spirit of the British rubber guarantee.

This committee is known as the Rubber Control Committee. The problems which it has been called upon to meet have been many and intricate, and have called for the exercise of the utmost care and judgment. Violations of the terms of the British rubber guarantee have occurred, as was to be expected, but the British authorities are apparently assured that, in spite of them, the great mass of American manufacturers and importers are fulfilling their promises.

The rubber embargo was one of the most serious situations that ever threatened the American rubber industry. Its subsequent modification, however, makes it possible for us to secure our supplies of rubber. I cannot tell what future conditions in this connection will be, as new complications, due to the war, may arise. Considering, however, the abnormal and extraordinary conditions existing during 1915, we have little cause for complaint.

The members of this committee, often at the sacrifice of their personal and business interests, have given freely of their time, and are truly discharging a most important and unselfish service—how important and unselfish will only be realized when this great war is at an end and the complete history of the rubber embargo has been written.

Reorganization:—When the Rubber Club of America adopted its constitution and by-laws at a meeting in April, 1913, it was thought that adequate provision had been made to carry out the purpose and objects of the club as a business organization. After our main office had been established in New York City, and it was realized that we were to occupy a more important position in the commercial world, the necessity of possessing broader corporate powers became plainly apparent. With the assumption of the duties incident to the British rubber embargo, this need became imperative.

Under our former charter it was mandatory to hold our meetings in Boston, but as New York became the center of our activities, it was thought advisable to hold our annual meetings there. Accordingly, proper legal steps were taken to annul our Massachusetts charter, and to apply for the charter of a new corporation to be known as The Rubber Club of America, Inc. This incorporation was effected under the laws of the State of Connecticut on March 19, 1915. Its constitution and by-laws were adopted at a meeting held in April, 1915, which gave all of the powers required. Coincident with this reorganization, the annual dues of firm members were increased to $50.00 per year, thus providing a sufficient income to meet our growing needs without, as in the past, levying extra assessments.

Legislation:—For the purpose of protecting the interests of the rubber trade against legislation, which might seriously and unjustly affect it, provision has been made in our new constitution for the formation of a standing Committee on Legislation. The duty of this committee is "to keep in touch with local, state and federal legislation affecting the rubber industry." When, in the opinion of this committee, and its counsel, proposed legislation is deemed to be of special interest to certain members, those affected will be furnished with a copy of the same. Our members are asked to co-operate with this committee, and to advise it of any matters which should be properly brought to its attention.

It is not without the range of possibility that the matter of tariff revision may again come before the country in the next few years, in which case your Committee on Legislation may find a larger field for usefulness. In connection with the tariff, it may be mentioned that our association is on the lookout for undervaluations and improper customs appraisements. I may add that the Rubber Sundries Division secured the adoption by the Board of General Appraisors of a list of such articles as should be entered under the druggists' sundries schedule of 15 per cent., thus clearing misunderstandings under this rather ambiguous schedule.

Group Membership:—In the last annual report I referred to the advantage of group membership, recommending the adoption of a clause in our constitution under which this could be accomplished. Such provision has been made in our new constitution and subdivisions of the manufacturers of mechanical rubber goods and of druggists' sundries have already been formed. These divisions have their own officers and have adopted rules and regulations harmonious with those of the main organization, and each is working out the particular problems which are peculiar to its own line. This division or group plan I consider of great value, and I hope that in the coming year other branches of the trade may join under it. As an example of the benefits of group membership, I may refer to the Credit Experience Bureau, which has been established by the Rubber Sundries Division, and which has proven of great value.

Arbitration:—The subject of commercial arbitration is one which is continually attracting more interest. This method of settling disputes, where decisions are based on submitted facts, has advantages that no one will seriously question. The Rubber Trade Association of New York has provided a plan of arbitra-

tion whereby disputes arising between members in the sale of crude rubber may be adjusted by this very satisfactory method.

It appears to me, however, that facilities for securing arbitration should be made easy and available to all of our members, and I sincerely trust that serious consideration may be given to the amendment of our constitution providing for the formation of a Committee on Arbitration, which will furnish the necessary facilities for the settlement of business disputes not only as between manufacturers and importers, but as between manufacturers and those to whom they sell and from whom they buy.

National Preparedness:—The subject of national preparedness is one of the vital topics of the day, and is in no manner a political question. A temporary committee has been formed to consider this important subject, and to report its recommendations.

Social:—The increasing activities of the Rubber Club along business lines have not resulted in any curtailment of the social features in connection with the club, which were so popular during the existence of the New England Rubber Club. We have continued the very excellent practice of holding a midsummer outing in New England each year. An outing was held at the Vesper Springs Country Club in July, 1915, which brought together in an informal way many of our members from all sections of the country, and was indeed a successful affair.

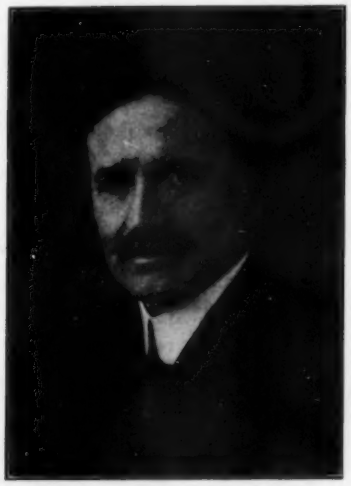
HENRY SPADONE.

G. E. HALL.

P. W. LITCHFIELD.

F. H. JONES.

VAN H. CARTMELL,
First Vice-President.



HARVEY S. FIRESTONE.
President.

H. STUART HOTCHKISS,
Second Vice-President.

W. E. BRUYN.

W. O RUTHERFORD.

C. T. WILSON.

J. S. LOWMAN.

W. J. KELLY.

DIRECTORS OF THE RUBBER CLUB OF AMERICA, INC.

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Underwood & Underwood.

Following the precedent established by many business and social organizations after the outbreak of the present war, we did not hold our annual banquet of 1915, but made contributions through subscriptions to the amount of $2,623.60 to the American Red Cross, Belgian Relief Fund and other funds for the relief of the sufferers in Europe. Our banquet, which will be held this evening, will, therefore, be the first banquet held since that of 1914, and, of course, the first given under the auspices of our new organization.

Membership:—The Rubber Club has shown a most satisfactory growth in membership since our last annual meeting. At that time, April 21, 1914, we had 66 firm members and 258 active and

associate members, making a total of 324; on January 1, 1916, there were 191 firm members and 227 associate members, making a total of 418. It is significant that firm membership increased nearly 200 per cent. during this period, proving the need of this organization, and a recognition by the trade of its useful work. Unquestionably our future growth as to members will not be as marked as in the past. There are, however, desirable manufacturers who should be brought within our ranks, and each and every member should use his best endeavors to interest any concern whose membership would tend to strengthen our organization. Recent statistics collected by your secretary show approximately 430 rubber manufacturers in the United States.

Legal:—The necessity safely to legally guide your board, officers and committees becomes of increasing importance with the growth of the association. With the creation of your new organization your Board of Directors retained Sidney S. Meyers, Esq., as counsel. To Mr. Meyers our appreciation is due for the very able manner he has handled the association's legal business, but more importantly for his excellent and skillful service in handling many novel and delicate matters submitted by the Rubber Control Committee in connection with the British rubber embargo situation.

Conclusion:—I desire to call attention to the very satisfactory manner in which the work at our office is being performed, and particularly to give recognition to the capable and faithful services of our secretary, Harry S. Vorhis. In the handling of delicate situations Mr. Vorhis has exercised tact and discretion and in the promotion of the usefulness of this organization he has shown untiring zeal. Under his direction all branches of our work are going forward with smoothness and efficiency.

Our appreciation is also due to the members of the Executive Committee for the energy and interest they have shown. The meetings of the Executive Committee have been well attended, despite the fact that some members have been obliged to travel a considerable distance to attend. Due recognition should be given to each member of the committee for his earnest and impartial service in your behalf.

In conclusion I take this opportunity of expressing my deep appreciation to the members of the Board of Directors, to the members of the several committees, and to the membership for their assistance, support and coöperation. On behalf of my successor and your new Board of Directors I ask that they be given the same admirable support and coöperation that has been accorded me.

NEW DIRECTORS ARE ELECTED.

The names put in nomination met with no opposition, and the following is a list of the new Board of Directors, which was elected by unanimous vote:

William H. Bruyn, L. Littlejohn & Co., New York City.
Van H. Cartmell, Kelly-Springfield Tire Co., New York City.
Harvey S. Firestone, Firestone Tire & Rubber Co., Akron, Ohio.
George E. Hall, Boston Woven Hose & Rubber Co., Cambridge, Massachusetts.
H. Stuart Hotchkiss, United States Rubber Co., New York City.
Frederick H. Jones, Tyer Rubber Co., Andover, Massachusetts.
William J. Kelly, Arnold & Zeiss, New York City.
P. W. Litchfield, Goodyear Tire & Rubber Co., Akron, Ohio.
J. S. Lowman, Philadelphia Rubber Works Co., Akron, Ohio.
W. O. Rutherford, The B. F. Goodrich Co., Akron, Ohio.
Henry Spadone, Gutta Percha & Rubber Manufacturing Co., New York City.
Charles T. Wilson, Charles T. Wilson Co., Inc., New York City.

NATIONAL PREPAREDNESS.

President Hodgman announced that the question of national preparedness had been called to his attention in such a way that he had taken the responsibility of appointing a temporary committee to consider this matter. This Committee on Preparedness consisted of R. B. Price, B. G. Work, Colonel A. F. Townsend and J. K. Mitchell.

The report which was read by the chairman, Raymond B. Price, treated the subject of preparedness in a broad and comprehensive manner. The meeting directed that it should be printed and distributed, so that all in the rubber industry may gain benefit from it. This report was as follows:

REPORT OF COMMITTEE ON PREPAREDNESS.

When in August, 1914, the great European war broke out all the theories of the altruists were "knocked into a cocked hat," and the world was confronted with a condition. President Wilson has finally come to realize that this condition brought serious responsibilities to his administration and it brings equally serious responsibilities to every intelligent American. Quoting President Wilson's speech of last Saturday in Cleveland, "Wherever there is contact there is friction," he referred to international contact.

In this country we have insufficient contact. America to-day is a mob of individuals filled either with indifference or with pet theories, when the great need of the nation is for self-sacrifice and unity of thought and action. This is no time for half way measures. Either we must follow the lead of China, or we must prepare immediately to face the world with all the thoroughness and all of the organized resources of this country.

Last week I spent an evening with a groupp of leading naval, military and civil authorities, and the note of the evening seemed to be one of hopelessness—the fear that America could not and would not, because of her very habits of extravagance, indifference and lack of unity, rise in time to meet the present emergency. President Hadley, of Yale, who cannot be accused of being an alarmist, ten years ago prophesied that unless America changed its habits the end of democracy was in sight.

The need in this country is to arouse the public conscience, and for the business and scientific men of the nation to insist upon this country being run along scientific business lines. I shall not bother you with numerous details; but if you will read the pamphlets which have reached you, or which will reach you in a few days, those who have not already posted themselves will learn something of the military inefficiency of this country for the past 140 years. The lawyer and the politician plus the indifference of you and me have permitted the critical condition which exist to-day.

When one pauses to consider that in the face of the dangers visibly confronting us, our army and navy are still administered as separate and frequently antagonistic units, that in the Philippines we are constructing defenses approved by the Naval Board and opposed by army experts as inadequate defense against land attack, and those defenses are costing $34,000,000; when we learn officially that the two battleships voted by Congress last March are not yet under construction, and that they have been apportioned to navy yards which cannot begin work on them for months to come; that the official intimation is that private yards are too busy with private work to handle government work; when reliable authority states that the private ship yards are in position to lay down 13 capital vessels immediately; when we remember that of the three largest battleships now under construction, the "Idaho," being built by the New York Shipbuilding Co., is 50 per cent. advanced as to hull and 36 per cent. as to machinery, but that the "California," authorized at the same time, and being built in the Brooklyn Navy Yard, is only 13½ per cent. advanced as to hull and 4 per cent. as to machinery; when we listen to the arguments in favor of Government-owned munition and shipbuilding plants because the private yards and manufacturers make excessive profits, and then listen to what our experts say, that in case of need the combined public and private yards and plants will be inadequate to our needs, every thoughtful American must stop to think what this means to him, to his family and to his country.

Japan is building battleships in half the time that we require, and building both merchant and naval vessels to the limit of her financial and building resources. During the past year she added 650 sea-going steamers to her fleet, while we have surrendered our last important fleet on the Pacific Ocean. Again, consider that of the $850,000,000 spent on waterways by Congress, a half billion dollars has been thoroughly wasted without benefit to the nation, and when we think how we ourselves smile at the mere mention of the pork barrel and tolerate such rottenness, which is flaunted openly in our faces, the American business man has indeed an accumulated responsibility to meet.

Some years ago Senator Aldrich claimed that the Federal Government could save $300,000,000 per year by applying ordinary business efficiency. About the same time Louis Brandeis claimed that the railroads of the country could save $1,000,000 per day by adopting demonstrated efficiency methods. Since then, under the pressure of an inefficient government, the railroads have become efficient. It is now time that the efficient railroads should force an inefficient government to become efficient.

The business men and industrial leaders of this country in general, partially for political reasons, are in bad repute. Those of us who believe that American industries are founded essentially upon integrity and service have a right to take such action as will tend toward a just public opinion, without which business men will not be in position to do their full share in leading the nation towards safer conditions. When railroad men were unjustly assailed, they united and fought back, and to-day have won public sympathy.

The automobile industry represents an unprecedented industrial achievement. This has been accomplished by standardization, the result of scientific thoroughness, open-mindedness and willing-

ness to make distinct sacrifice on the part of individuals for the good of all. The industry, as it exists to-day, would have been utterly impossible with the jealousies, lack of coöperation and self-sacrifice common in the rubber industry. One small company in New Jersey at one time had 800 different styles of lock nut washers between the sizes of ¼ and ⅝ inch. By standardization this number was reduced to 20. Many manufacturers were obliged to scrap expensive supplies to achieve this benefit of standardization, the result of which was that all manufacturers were able to obtain standardized supplies in large quantities at low cost, and in minimum time.

Something can be achieved along this line in the rubber industry by co-operation with the Government; but probably the greatest opportunity for the rubber industry is to set an example to other industries of this country, indicating that we, as rubber men and as individuals, realize our responsibilities and are prepared to make sacrifices to live up to them.

Figuring that there are over a quarter of a million people directly engaged in rubber work, and that these workers have an average of only three persons dependent upon them, there are 1,000,000 people directly dependent for their very existence upon uninterrupted supply of crude rubber, most of which comes half way around the world, and practically none of which is produced within our own borders. Even if this country is prepared against invasion, is it prepared to insure that uninterrupted supply of crude rubber, upon which a million lives depend? At least three maritime nations stronger than ourselves could stop that flow, even if we were nominally at peace.

Those who have had the responsibilities of facing embargo conditions a year ago realize better than the rest of us what this means to America. The adequate supply of crude rubber to the United States under the complicated international conditions now existing is by no means assured; and it is up to us of the Rubber Club of America to do our part wisely and well to prevent disaster. This cannot be accomplished by leaving the work to be done by any individual or by a committee. If every man is not willing to contribute his part the men conducting the rubber industry, which is more susceptible to injury than most other American industries, may have to face a terrible responsibility to employes, customers and stockholders.

Aside from the million directly involved and the other millions indirectly concerned, think of what a calamity it would be if the advantages of the beneficient services of rubber were suddenly eliminated! It has been stated that the country would be paralyzed if the telephone and the telegraph were suddenly destroyed. The day is almost here when the same can be said of rubber, and what depends upon rubber; and this is especially true of the needs of modern warfare.

We may think that the tariff question does not concern us as much as it does other manufacturers. Is it not conceivable, however, that the foreign countries which control the entire rubber supply of the world might easily manipulate their export regulations so that this country should receive little or no crude rubber, or at such prohibitive prices as to spell disaster to the industry?

Our present tariff contains no provision for international bartering or privilege. Our pork barrel, pension expenses and general governmental extravagance are preventing this country from having the visible naval power which chiefly compels concessions in time of extreme need. We have deliberately and voluntarily turned over to foreign nations the carrying of our products and the bringing to us of our raw material.

We have permitted our employes by hundreds of thousands to be misinformed and misled by agitators to their own ultimate danger and have not made the slightest effort to present to them the other side of the question. In a country where millions of people care not what flag they are under, we, the business people, have been strangely indifferent to our responsibilities in the field of patriotism, education, humanity and even common safety.

Much of the agitation for preparedness has been emotional. If the business and scientific men will not unite in a thorough, persistent campaign, based upon logical business common sense, no man can foretell the result. What can the business and scientific men do? President Wilson and Secretary Daniels builded better than they knew in forming the Naval Consulting Board, which is composed of conscientious scientific men trained to do things, and to do them thoroughly and quickly. They have organized themselves for results regardless of political pressure. and have secured the coöperation of the 38,000 members of the five leading scientific societies of the country.

Their plans are well under way, first, to investigate the manufacturing facilities of this country, and then to organize them. While I am not privileged to disclose their plans in detail, such as have come to me I can vouch for as being feasible and thorough. Many scientific men occupy subordinate positions; so it becomes essential for the greatest speed in obtaining results to have the sympathetic coöperation and support of business men in this mobilization of American industries.

It is believed that a body of representative business men may be created and recognized by Federal executives, who can coöperate with the government experts and scientists of the country, not only to mobilize American industries, but to teach efficiency to the government itself. Each industry must be so organized within its own sphere as to be able to coöperate in this national scheme; and this is one of the opportunities for the committee on preparedness which is today proposed for the Rubber Club of America.

Every individual and every company has a direct and distinct opportunity to assist in this movement. The United States Rubber Co., for instance, has made an initial appropriation of $1,000 to assist in the education of its employes. As a first move, specially chosen pamphlets are being sent to 4,500 of its most intelligent members, indicating the seriousness of conditions, pointing out some of the weaknesses, and suggesting that each individual should investigate the facts, form his own opinions, write to his congressman and senators, and talk with his friends and customers.

There must gradually be formed an intelligent public opinion crystallized along several specific lines. All of our resources for defense must be coördinated and directed by a national council of defense. Universal military training must be eventually recognized as the only safe and democratic support for our regular army. Every section of the country must be compelled to subordinate local advantage to national safety. General governmental efficiency and economy in administration at the expense of the pork barrel must be quickly achieved.

The budget system for appropriations must be generally applied. The tariff must be scientifically studied, and so applied as to stabilize industry in this country, and protect the interest of Americans both at home and abroad. An adequate merchant marine must be developed in conjunction with naval auxiliary needs along such lines as to standardize and insure the most speedy and economical production and operation.

Coöperation, rather than antagonism, must be fostered between government and private shipyards, factories and other activities. Trade and business associations should be encouraged and officially recognized as important media for coördination, mobilization and efficiency.

Thorough study must be made of the laws and conditions, whether state or federal, which unnecessarily restrict and hamper business activity. Where legislators are antagonistic to national welfare, dispassionate investigation of the causes should be undertaken to the end that the public shall know the facts.

Study should be made of the American cable system to make sure that foreign cable communication shall be as little as possible affected by international quarrels in which we are not directly involved.

An American navy, adequate to protect the 30,000 miles of coast line in this hemisphere, and to sustain the honor and ideals of America at home and abroad, must be built in the shortest possible time. American education and American patriotism must also feel the influence of the present need for unification. Human welfare, the greatest undeveloped asset of mankind, must receive sympathetic and thorough attention.

We have aliens in our factories and stores, and can help to make them safe American citizens or more intelligent residents in our American atmosphere. The people who do not care what flag they are under can be shown that the working people suffer most when the enemy strikes.

Posters containing a concise statement of salient facts, based on well-known advertising principles, are being prepared for distribution in factories, offices, stores, etc. These offer the best means yet suggested for reaching the man who scoffs at literature and will not read a pamphlet. The fact that, of all nations in the world, America has more international policies, which challenge and antagonize the rest of the world, must be brought home to every American, whether from the point of view of taxpayer, voter, or of the one who desires to live in peace.

THE EXECUTIVE COMMITTEE ELECTS OFFICERS.

Immediately after the annual meeting of The Rubber Club of America, Inc., the new board of directors met and elected the following officers for the ensuing year:

President: HARVEY S. FIRESTONE, Akron, Ohio.
First Vice-president: VAN H. CARTMELL, New York City.
Second Vice-president: H. STUART HOTCHKISS, New York City.
Secretary and Treasurer: HARRY S. VORHIS, New York City.

HOW THE RELIEF FUND FOR BELGIAN REFUGEES WAS SPENT.

It will be recalled that the usual annual dinner of the Rubber Club was not held in 1915, the members having decided by a large majority to contribute the money generally spent for this purpose to the American Red Cross, the Belgian Relief Fund and other humane agencies that were relieving suffering caused by the war in Europe. The contributions were prompt and generous.

The money for the relief of Belgian refugees was turned over to Captain Ernest E. Buckleton, president and general manager of the Northwestern Rubber Co., Liverpool, England, who at that time was spending a few weeks in the United States. Captain Buckleton, who was well known among the rubber trade both in England and in this country, in addition to liberal contributions of money donated the use of a house that he owned in Liverpool for the refugees. This house, which was opened on October 17, 1914, gave hospitable accommodations to thirty-one refugees, principally women and children of the better class. The Rubber Club of America, Inc., through its generous contributions, has aided materially in supporting this worthy work.

The home is under the management of a housekeeper, and at present has but fourteen inmates. Sufficient funds are reported in hand to run it until April 1, when it is proposed to close the house and turn the refugees over to the Liverpool committee, together with any remaining funds. It is interesting to note that of the 200,000 Belgian refugees in England over 1,300 were taken care of in Liverpool, whose citizens, like Captain Buckleton, responded freely to the call of humanity.

REUNION OF THE EMBARGO COMMITTEE.

The New York members of the Embargo Committee, consisting of George B. Hodgman, H. Stuart Hotchkiss and William E. Bruyn, held a reunion dinner on Wednesday, February 9, at Sherry's, in New York City, at which Arthur H. Marks, of Akron, Ohio, the other member, was the guest of honor. It will be recalled that this committee was largely responsible for the successful lifting of the rubber embargo in January, 1915.

THE TIRE FACTORY SERVICE BUREAU ORGANIZES.

The Tire Factory Service Bureau, Akron, Ohio, has been organized to assist tire manufacturers by furnishing expert advice and supervision. It supplies a want frequently felt by manufacturers, of a source from which assistance necessary to adjust complications or remedy defects can be secured. The service given by the bureau consists of mold and core designing, purchasing and installing equipment, selecting crude rubber, compounding, tire construction, overcoming manufacturing defects, promoting efficiency, scrap utilization, experimental service, etc.

ANALYSIS OF RUBBER FLOOR COVERINGS.

The amount of rubber used in commercial samples of floor tiling has been made the subject of investigation and report by the International Association for Rubber Cultivation in the Netherlands East Indies.

Slight wear and softness combined with elasticity are considered the chief advantages of rubber tiling over other floor coverings. Grinding tests were made for ascertaining the wearing qualities and the hardness of the samples was determined by the Breuil "elasto-durometer." The percentage of rubber in the samples was determined by deducting the sum of the resin, alcoholic extract and the part insoluble in paraffin from 100.

The author presents a tabulation of his analytic results, including thirty-five samples, seventeen of which are commercial products and the balance samples made in the Government Experimental Station at Delft. The conclusion presented is that minimum percentage of new rubber for a mixture for floor covering should be from twenty to thirty per cent. The recommendation is made that the purchaser make the rubber content a matter of specification to be checked by analysis.

CAUSES OF SPREADER FIRES.

To the Editor of THE INDIA RUBBER WORLD:

I have had the fires on which the curve, published in your issue of February 1, 1916, on Humidity and Rubber Spreaders, looked up and they are as follows:

JANUARY, SIX FIRES.

January 23, 1893. Cause unknown.
January 25, 1909. Friction.
January 10, 1911. Static electricity, from the electro-static capacity of a man's body when handling gasoline.
January 26, 1912. Static electricity, due to cloth friction on spreaders.
January 9, 1913. Cause unknown.
January 31, 1913. Static electricity from a knife in the hand of a workman on a rubber spreader. Static capacity of the man's body probably a factor.

FEBRUARY, SIX FIRES.

February 3, 1911. Cause unknown.
February 15, 1911. Cause unknown.
February 16, 1911. Friction in machinery.
February 15, 1912. Cause unknown.
February 17, 1912. Cause unknown.
February 8, 1913. Static electricity.

MARCH, FOUR FIRES.

March 24, 1911. Cause static electricity.
March 2, 1912. Cause static electricity.
March 5, 1913. Cause unknown.
March 5, 1913. Cause unknown.

APRIL, THREE FIRES.

April 7, 1909. Static electricity.
April 26, 1911. Static electricity.
April 29, 1912. Static electricity.

MAY, TWO FIRES.

May 1, 1912. Static electricity.
May 17, 1912. Static electricity.

JUNE, ONE FIRE.

June 11, 1907. Cause unknown.

SEPTEMBER, TWO FIRES.

September 21, 1910. Cause, static electricity.
September 27, 1912. Cause unknown.

DECEMBER, THREE FIRES.

December 8, 1907. Cause unknown.
December 7, 1908. Cause unknown.
December 8, 1908. Cause unknown.

Yours very truly,

F. J. HOXIE,
Engineer and Special Inspector,
Associated Factory Mutual Fire Insurance Cos.

Boston, Mass.

NEW TRADE PUBLICATIONS.

Katzenbach & Bullock Co., Trenton, New Jersey, has issued a convenient pocket catalogue of chemicals and colors. The list includes a line of industrial chemicals, oils, colors, etc., employed in the rubber trade.

An interesting method of tire repairing which really consists of rebuilding the injured part of the casing, is described in the January issue of "The Goodrich," distributed by The B. F. Goodrich Co., Akron, Ohio.

The net price list of Beacon Falls Rubber Footwear, issued under date of January 1, by the Beacon Falls Rubber Shoe Co., Beacon Falls, Connecticut, is a 40-page booklet illustrating the "Top Notch" footwear.

"Insuring the Coal Supply" is the title of a new pamphlet just issued by the Link-Belt Co., Chicago, Illinois, showing methods of handling coal in large industrial works. "Wagon and Truck Loaders" is another pamphlet sent out by the same concern describing small mechanical loading conveyors.

Development and Changes in the Golf Ball Industry.

AT the present time considerable attention is being attracted to the golf ball industry owing to the fact that the Haskell patent, under which most of the popular golf balls are manufactured, is about to expire in the United States, and also that announcement has been made that The B. F. Goodrich Co., Akron, Ohio, has disposed of its golf ball business to A. J. Reach Co., Philadelphia, Pennsylvania.

When the Haskell patent expires on April 11, it is expected that balls of English manufacture will be imported into the United States in large quantities to compete with American balls now on the market. Announcement has been made that the high-grade American balls, such as the "Whippet" and the "Dimple," will be sold at the same price as formerly, $9 per dozen, and that the "Silver King," a popular English ball, will be offered to the public on April 13 at the same figure. To compete with other English balls that may be imported, it is said that American made balls formerly selling for 65 cents each will be offered this season for 50 cents, that 50 cent balls will sell for 40 cents, while others may be marked as low as 25 cents each.

It will be remembered that in 1905 the English courts decided that the Haskell patent on golf balls did not hold in England because of prior uses of the same principle. Then the English balls began to make their appearance in this country through mail deliveries to individuals, but few sales were actually made by this method, and it was soon discontinued.

FEATHER BALL.

HAND-HAMMERED GUTTA PERCHA BALL.

"ECLIPSE" BALL.

"SILVERTOWN" BALL.

WINDING OF "HASKELL" BALL.

RUBBER RINGS OF "BOGEY" BALL.

SECTION OF "PNEUMATIC" BALL.

"DIMPLE" BALL.

THE HISTORY OF THE GOLF BALL.

There is no record as to the age of golf. It is known that it became fairly popular in Great Britain during the fifteenth century. It is also recorded that golf was denounced from the pulpit in Scotland because it was played "in tyme of sermonses," leaving only empty benches in the "kirk" and in parliament, because it led to neglect of the art of war so necessary for defense against the English. One of the Scotch kings imposed a prohibitory duty upon imported golf balls because they were taking too much gold out of the country.

Three or four hundred years ago golf was played with a leather covered feather ball. The leather was of untanned bull's hide, the covering consisting of two round pieces for the ends, and one zone piece for the middle. After being softened, these pieces were shaped and then firmly sewed together, a small hole being left through which the feathers were afterwards inserted.

Before stuffing the ball the cover had to be turned inside out through this little hole, thus bringing the seams on the inside—an operation not without difficulties. The making of this feather ball was considered one of the most arduous labors of the day, because in the packing, the feathers were inserted through the small opening in the leather cover, and pressed in with an iron rod, one end of which had a small, flat breast-plate, which enabled the maker to use the weight of his body to compress the feathers. This work was so severe that golf ball makers in those days seldom lived past 38 years.

The balls cost about 5 shillings each, and were an expensive item, for money was of more value then than now. Golf was only played by the very rich, as the other classes could not afford to buy the balls, and it was referred to as the "gentlemen's game." The size of the old feather ball was the same as the balls now in use, approximately twenty-seven and one-half sixteenths of an inch in diameter.

In 1848 gutta percha balls were first introduced into Europe, Sir Thomas Moncrieff, an English enthusiast, being generally credited with having conceived the idea of making golf balls of this material, although the Rev. Robert A. Paterson claimed to have rolled gutta percha clippings into a ball, which he painted and used on the links in 1845.

Gutta percha balls soon became popular as their price was about one-fifth of that of the original feather balls, thus bringing golf within the reach of many. The number of devotees

rapidly increased. In making the earlier gutta percha balls, the gutta was boiled until soft and then rolled by hand until smooth and round, but its flight was never true and, strange to relate, the more it was played with and hacked about, the better its flight seemed.

Then some one suggested that the surface of the ball might be nicked into lines with a shoemaker's hammer, and this was done with good results. The flight of the "hand hammered" ball was now all that could be desired, and the feather ball was doomed. The demand for balls grew to such an extent that ball makers, who formerly were situated at the links, selling every ball direct to the players, were forced to produce balls in larger quantities and by a quicker method. By this new procedure, when the gutta was softened, a quantity sufficient to make one ball was kneaded and rolled in the palms of the hands, then put into a steel mold and pressed in a vise until sufficiently cool to be taken from the mold and dropped into cold water to harden.

The problem of marking more quickly than by the hand hacking method was solved by the use of a mold made with the markings cut inside. The ball was dipped into hot water, put into the marking mold and squeezed again in the vise, with the result that the ball was regularly marked all over.

By this time the manufacturers of gutta percha goods, who were chiefly large rubber concerns, began to interest themselves in the golf ball industry, and made the gutta percha into rods of sufficient size to make one dozen balls. The small makers bought these especially, as the gutta was then already cleaned and massed, and only required to be cut and stuffed into the molds, painted and sold.

Freshly made balls, however, were so soft that they soon lost shape, and seasoning was found necessary. The small makers could not afford to put their manufactured balls aside for any length of time, so large manufacturers with plenty of capital took up the making of golf balls.

The India Rubber, Gutta Percha and Telegraph Works Co., Silvertown, London, was among the first to do this. When the products from the large manufacturers were placed on the market, the game which had been held in check for want of supplies began to forge ahead, and even working men took up golf.

In 1884 the "Eclipse" ball, made of a composition of cork, rubber and gutta percha, was introduced, and many thought it would meet the demand. It did not chip or lose shape, but it proved to be too heavy, and would not rise, but rolled along the golf course and into every bunker on the links. The paint did not stick properly, and the ball became black when a few holes had been played. This disgusted the players and the ball died a natural death.

The "A1" ball, made of pure gutta percha, followed the "Eclipse" and for a time was popular. The Silvertown company then brought out the "No. 4" ball, made of black gutta. This displaced the "A1," as it was harder and more serviceable. The first pebbled ball was called the "Ocobo." It had a harder surface than any of its predecessors and soon met with favor. All of these balls of this period sold at one shilling each, which was considered a high price, until the Silvertown company once more came to the front in 1890 with a new ball called the "4 S's," composed of pure gutta percha, which possessed the greatest driving qualities of any ball yet produced. It had a pinkish shade before painting, kept its shape, held its own against competitors, and sold for a guinea ($5.10) a dozen. This relatively high price did not stop the sale, and the demand was so great that it became difficult to fill orders.

At this time America was being smitten with the golf fever, and the ball question was taken up seriously, and good solid gutta balls were produced by the Boston Belting Co., the Davidson Rubber Co. and others. After experimenting with the comparatively unsatisfactory balls of that time, Bertram G. Work, of Akron, Ohio, and Coburn Haskell, of Glenville, Ohio, devised a ball which was patented April 11, 1899. Their patent provides for "a golf ball, comprising a core composed wholly or in part of rubber thread wound under high tension, and a gutta percha inclosing-shell for the core, of such thickness as to give it the required rigidity," and also in the second claim, for "a golf ball, comprising a central core section of relatively non-elastic material, rubber thread wound thereon under tension," etc.

The extra distance resulting from this new ball called the "Haskell" won the hearts of all golfers. The only drawback to it was that it did not have a "click" when hit by the club, and to golfers in those days, half the pleasure was that fascinating sound. This difficulty, however, was soon overcome. The "Haskell" ball when first made was produced laboriously by winding rubber threads on the core by hand, and the total output for one man was three balls a day. After experimenting, The B. F. Goodrich Co. devised a machine that in three minutes accomplished the same work that one man formerly produced in a day.

This ball has a core of soft rubber about the size of a small marble around which are wound seven hundred feet of tightly stretched rubber thread, and the whole is covered with gutta percha about one-eighth of an inch thick. All patent infringements were successfully stopped except in England. Licenses for the manufacture were granted by the Haskell Golf Ball Co., of Akron, Ohio, to several manufacturers desiring to make balls under the Haskell patent.

In 1902 the Kempshall Manufacturing Co., Arlington, N. J., took out sixty patents on golf balls, of which the main features were the use of plastic material forced into a hollow sphere of rubber or gutta percha, and also a sphere expanded by liquid gutta percha and covered with celluloid. Later, in 1905, a "Pneumatic" golf ball was introduced by the Goodyear Tire & Rubber Co., Akron, Ohio. This consisted of a core which was a retainer into which air under pressure of eight hundred pounds per square inch was forced. The "Bogey" ball, made by the Seaman Manufacturing Co., Milwaukee, Wisconsin, appeared in the same year, and had a non-elastic center on which were tightly stretched small rubber rings over which was the usual gutta percha cover.

The latter day balls include the "Colonel" of the St. Mungo Manufacturing Co., Glasgow, Scotland, and New York City, and the green, red and black "Circle" balls of Wright & Ditson, Boston, Massachusetts, which appeared in 1911. The next year saw the advent of the "Dimple," made by A. G. Spaulding & Bros. in both this country and Great Britain. Other well-known golf balls are the "Whippet," formerly manufactured by The B. F. Goodrich Co., Akron, Ohio, and now by A. J. Reach Co., Philadelphia, Pennsylvania; the "Diamond" balls of the Worthington Ball Co., and the latest balls, "Bullet Honor," "Witch," "Wizard" and "Orange Domino" of A. G. Spaulding & Bros. The "Whippet," "Stag," "Meteor" and "Scotty" balls, all made under the "Haskell" patent, have been sold by The B. F. Goodrich Co. to the A. J. Reach Co.

A FRENCH TRADE STAMP.

Symbolic stamps or "stickers" are extensively used by European concerns for attaching to correspondence. The stamp here shown is used by the Société des Etablissements Bergougnan, Clermont-Ferrand, Puy-de-Dôme, manufacturers of "Le Gaulois" tires. The golden sun of prosperity, rising over the peak of the Puy-de-Dôme, casts its light upon the effigy of Vercingétorix, the great Gaulois, hero of the struggles of the Gauls against Roman domination and adopted as the symbol of the "Gaulois" tires. The graceful folds of the French tri-color add to the picture and indicate that "Le Gaulois" tires are of French production.

What the Rubber Chemists Are Doing.

VULCANIZATION EXPERIMENTS.

DURING the past year B. J. Eaton and J. Grantham, of the department of agriculture of the Federated Malay States, have continued their experiments in vulcanization on the extent of variability caused by lack of uniformity in factory methods, which are reported in the "Agricultural Bulletin."

EFFECT OF CREPING.

Samples of rubber were prepared, which had been crêped as follows: A, 5 times; B, 10 times; C, 15 times; D, 20 times; E, 25 times. These were mixed and cured under uniform conditions, time of cure in all the experiments being the only variable. The resulting physical tests gave no indication of any differences between the rubbers due to the amount of crêping they had undergone.

Although the differences in crêping in this experiment were insufficient to produce any effect, it was thought a more severe treatment of the rubber would produce deterioration. A sample of crêpe treated in the normal matter, and one severely macerated on the crêping machine, when compared gave physical test figures which revealed no effect as regards the mechanical results. The effect of very severe maceration was merely to slightly retard the rate of its cure.

It was therefore concluded that the effect of crêping on rubber, both as regards optimum mechanical properties and rate of cure, is negligible unless excessive. The slight effect in retarding the rate of cure in excessively worked rubbers is probably due to removal of traces of a catalytic substance or something necessary to its formation; in other words, to over-washing rather than over-working.

EFFECT OF EXCESS OF ACID.

Two samples were prepared from bulked latex to ascertain the effect of adding an excess of acid when coagulating the latex. Sample A was coagulated by 3 ounces of 5 per cent acetic acid per gallon of latex, and Sample B 15 ounces of 5 per cent acetic acid per gallon of latex. The subsequent manipulation was kept as constant as possible.

The results showed that the use of an excess of acetic acid for coagulation of the latex has a well marked effect in retarding the rate of cure. Probably the acid has the effect of reducing the amount of the catalytic substance finally present in the dry rubber. The mechanical properties are not affected.

EFFECT OF SODIUM BISULPHITE.

No effect was produced by sodium bisulphite on crêpe rubbers. There is reason to believe that the use of sodium bisulphite in the preparation of sheet rubbers, and other forms in which the bisulphite is not afterwards completely removed, is injurious.

PREPARATION OF THIN CREPE.

Samples were prepared on an estate normally turning out thin, pale crêpe, and each represented a stage in the ordinary process adopted by the estate. The samples were:

A. The coagulated slab allowed to drain.
B. The coagulum rolled once.
C. Rough crêpe.
D. Thick crêpe.
E. Thin crêpe.

The samples were kept for 20 days, and then A, B and C were made into thin crêpe and dried. D and E were dried without subsequent crêping. All the samples contained sodium bisulphite. The tests showed time of satisfactory cure by load-stretch curves as follows: A, 1½ hours; B, 2 hours; C, 2½ hours; D, 2¾ hours, and E, 3 hours.

UNIFORMITY.

An experimental study was made to ascertain how far uniformity is possible under ordinary estate conditions. The latex was bulked in a large tank and coagulated by the addition of 3 ounces of 5 per cent acetic acid per gallon of latex. The rubber was crêped the same day, an hour or two after coagulation. It was found necessary at this time to add a small quantity of formalin to the latex in order to prevent spotting. The resulting thin crêpe was of a golden color, and brought top prices.

The experiments on thin crêpe and uniformity of preparation are thus summarized: The effect of each stage in the preparation of a thin crêpe is to retard the rate of cure. It has previously been shown that passing a thin crêpe a number of times through a crêping machine, beyond that necessary first to produce thin crêpe, had little or no effect. When the retardation of the rate of vulcanization reaches a limit, as in the preparation of thin crêpe machined on the day of coagulation, a very uniform rubber is obtained, although the rate of cure is very slow and the mechanical properties suffer slightly.

PREPARATION OF BLOCK RUBBER.

The process of preparing block rubber is to thick crêpe the coagulum on one machine and thin crêpe it on another, and then "worm" it by passage through a perforated plate by pressure. The wormed rubber is then placed in hot air driers for 7 to 8 hours at about 130 degs. F. until completely dry. It is then blocked while still warm in a hydraulic press.

Twelve samples were taken representing the stages from coagulum to the final block, mixed, vulcanized and tested in two sets, the samples of corresponding stages in each set varying as regards age and the use of sodium bisulphite.

These experiments indicated a convenient method of producing a rapidly curing rubber with good physical properties, namely, the slab from the coagulum, with or without sodium bisulphite, should be left ten days to "mature" or develop a rapid rate of vulcanization, previous to being converted into block form. The uniformity of the rate of cure thus produced remains to be tested.

MIXING RAW RUBBERS.

The effect of mixing raw rubbers having different rates of cure was demonstrated, and showed a gradation in rate of cure according to the proportion of fast or slow curing rubber in the mixture. These results are of importance as confirming the probable reason for the uniformity of fine hard Pará, namely, that it is due to averaging of latex collected and cured on different days through long intervals.

A method of averaging could be adopted on any estate to obtain similar results, and would be of marked advantage, but the problem of sampling the mixed rubber for testing would probably be complex.

VELOCITY OF SOLUTION OF LIQUIDS IN RUBBER.

From available data relating to the velocity of the absorption of various liquids by rubber, P. Bary concludes that for any given liquid, the weight, p, of the liquid contained in a unit weight of the rubber (*i. e.*, rubber plus absorbed liquid) after absorption has proceeded for t minutes is given by the formula,

$$p = \frac{tp_s}{(A + t)}$$

in which p_s is the value of p corresponding with the saturation of the rubber with the liquid, and A is a constant depending upon the nature of the liquid and the conditions of experiment, particularly the thickness of the rubber sheet.

The values for p_0 for some of the liquids as used in experiments were: carbon disulphide, 0.916; chloroform, 0.940; toluene, 0.870; ether, 0.718; benzol, 0.840; xylene, 0.849; light petroleum spirit, 0.763; oil of turpentine, 0.848; benzyl chloride, 0.841; nitrobenzene, 0.639.

It follows from the formula that the velocity of absorption in any one experiment is proportional to $(p_0-p)^2$.

SOLVENTS OF GUTTA PERCHA.

Herman Prinz has found that oil of eucalyptus and oil of cajuput dissolve gutta percha due to the presence of cineole. Oil of cloves and oil of cinnamon do not contain cineole and apparently have no solvent effect on gutta-percha.

CHEMICAL TREATMENT OF RUBBER.

THE UNITED STATES.

ELASTIC PRODUCTS. 1,159,257 and 1,159,258. Georges Nuth.—The process consists of producing from a sulphurized oil factice by the action of a compound (amin) capable of removing loosely combined chlorine, a resulting body more resistant to heat, water and acids than natural gums, and with a greater elasticity than the corresponding chlorinated factice.

ISOPRENE. 1,159,380. A. Heineman. Vapors of turpentine oil are passed over silver heated to about 450 degrees F., giving a yield of isoprene equal to 25 per cent. of the turpentine oil used, together with about an equal amount of other depolymerization products. About 2000 cc. of vapor per hour may be passed through a silver tube of 6 mm. diameter, 4 meters long, wound into a close coil.

PIGMENT. 1,169,253. Henry A. Gardner. Process for making a pigment containing lead and barium carbonates, which consists in forming a basic carbonate of lead and precipitating barium carbonate in intimate association therewith.

RUBBER SUBSTITUTE. 1,171,187. Alfred A. Glidden, assignor to Hood Rubber Co. The process consists of heating vulcanized rubber waste with any unsaturated hydrocarbons of the series to which butadiene is the lowest member, and stearic acid in definite proportion, the operation taking place in sealed vessels at 212 to 248 degrees F. for periods of one to three weeks.

THE UNITED KINGDOM.

WATERPROOF COMPOSITIONS. 24,106 (1914). C. L. E. Melsom-Brixton. A resilient waterproof composition is obtained by steeping gelatin or glue or both in skimmed or separated milk, then mixing with glycerin, applying heat to produce liquefaction, and finally adding potassium bichromate, ground leather, and other ingredients, such as dextrin, paraffin wax, Venice turpentine, linseed oil varnish, glucose, and a preservative with or without coloring matter, the mixture being heated and stirred.

THE DOMINION OF CANADA.

PROOFING FABRIC WITH RUBBER. 165,820. William Muntz. The process consists of impregnating with two solutions, successively introducing with the second solution substances capable of forming harmless compounds in the fabric by neutralizing the sulphurous and sulphuric acid present.

ELASTIC MATERIAL. 166,177. Maurizio Baricelli. A combination of a gelatinous substance, water, glycerine, antimony pentoxide, acetic acid. Before using there is also added formalin and a substance of high thermal conductivity such as powder of aluminum.

OTHER CHEMICAL PATENTS.

THE FRENCH REPUBLIC.

PATENTS ISSUED (With Dates of Application).

477,586 (February 10, 1915). Process for accelerating the vulcanization of natural or artificial rubber or similar materials. S. J. Peachy.

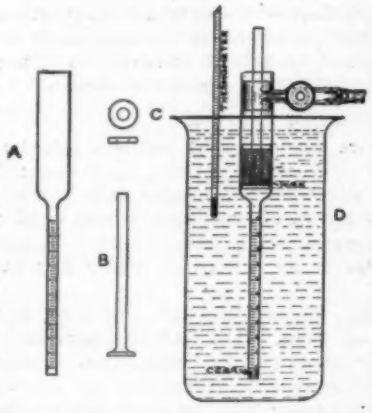
477,789 (February 24, 1915). A mastic filler for pneumatic tires, and process of manufacture. S. Ephrussi and S. Bernstein.

LABORATORY APPARATUS.

MELTING POINT OF PARAFFIN WAXES.

AN apparatus and method for studying the melting point of paraffin waxes, as proposed by F. H. Small, will be of interest in rubber laboratories.

Commercial paraffin is not a chemical individual but a mixture of related compounds. Its so-called melting point is merely the average of the melting points of the numerous waxes making up the composite whole. Two samples of paraffin wax, designated as of the same melting point, may be of radically different composition. A so-called crude may consist of individual waxes whose melting points cover a wide range of temperatures, while a refined wax may consist to the extent of over 90 per cent of waxes whose melting points lie within a range of 5 degrees. Naturally these two waxes will not behave in the same way, will not show the same plasticity and physical qualities. It was to secure a more definite idea of the composition of commercial paraffin wax than was afforded by a simple melting point determination that the apparatus here described was constructed.



In the accompanying diagram—

A is a glass tube, the smaller part being of uniform bore and graduated in equal divisions; *B* is a glass plunger the disk of which fits easily the bore part of the enlarged part of *A*. *C* is a brass disk bored to fit the stem of *B* and of the same external diameter as the disk of *B*.

In use *B* is inserted in the upper part of *A*. Enough of the wax is shaved and introduced into *A* so that when melted it will nearly fill the graduated tube of *A*. The brass disk *C* is then slipped on *B* and allowed to press down the shaved wax. The lower end of the graduated tube *A* is closed with a cork reaching just to the zero mark and the apparatus as prepared is inserted in a tall one-liter breaker filled with water to above the level of the wax as shown in *D*.

The water is warmed by a burner below and is stirred at frequent intervals. The warming process is continued until such time as the wax shows signs of softening. The temperature is then raised very gradually, the plunger *B* being moved slightly up and down to facilitate the flow of any melted wax into the graduated tube. When some of the wax melts and runs down, the temperature at which this occurs is recorded. The temperature is then raised a degree at a time and held at each degree for seven minutes, the plunger *B* being moved slightly up and down at intervals, as before, to free the melted wax. At the end of each seven-minute period the temperature and scale reading are recorded. The process is continued until the wax is all melted.

From the scale readings a simple calculation shows the percentage of the wax melted at any given temperature. The temperature at which 50 per cent was melted corresponds to the melting point as usually determined. If the melted wax is allowed to harden in the tube its inspection will usually show whether the wax contains an appreciable amount of oil.

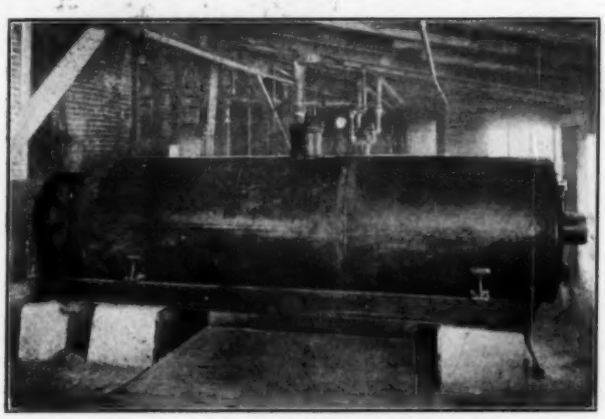
The apparatus and method have been found sufficiently accurate for commercial purposes.

New Machines and Appliances.

ROTARY VACUUM DRYER FOR RUBBER SCRAP.

THE illustration shows a new Stokes rotary vacuum dryer which has recently been installed and is now being operated in the works of a large rubber company. The rubber is claimed to be dried uniformly, economically and quickly.

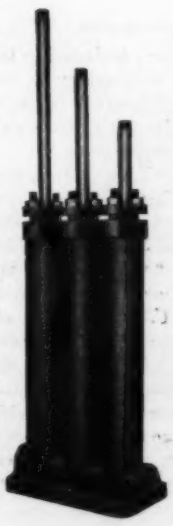
The apparatus is equipped with an agitator so that any material carried over with the next charge will not become hard by over-drying. This agitator, which requires very little power to operate, discharges practically the entire contents of the



machine and insures uniformly dried material, containing an exact percentage of evenly distributed moisture. The rubber is dried in vacuo at a very low temperature, thus giving a soft and strong product.

It usually takes six men over two hours to spread and take off the rubber when screens are used, but it is said that with this vacuum dryer, three men can do the work in a half hour. The drying is accomplished in from one to six hours, varying with the nature of the scrap. The machine is fifteen feet long by four feet in diameter and has a capacity of from 4,000 to 12,000 pounds in ten hours. [F. J. Stokes Machine Co., Philadelphia, Pennsylvania.]

MULTIPLE EXPANSION JOINTS.

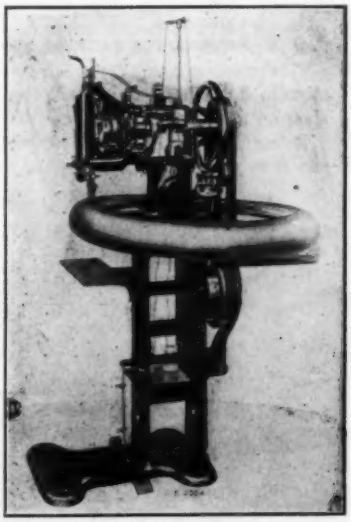


Multiple plate vulcanizing presses that are used in the manufacture of molded rubber goods have from two to seven heating platens. To turn out reliable goods exact temperatures are now required in most rubber manufacturing plants. It is therefore necesssary that all plates in vulcanizing presses should be maintained at the same temperature. This is practically impossible, however, where the steam is passing directly through the press, as the drop in temperature is usually about 2 degrees F. from one platen to the other. The multiple expansion joint shown in the accompanying illustration supplies steam to each plate independently, thereby maintaining an even temperature throughout the press. The advantage in thus being able to obtain definite cures will appeal to every manufacturer of molded rubber goods. [Utility Manufacturing Co., Cudahy, Wisconsin.]

SEWING MACHINE FOR RE-TREADING TIRE CASINGS.

For tire repair shops that make a specialty of repairing tire casings, the machine illustrated herewith should prove useful.

If the re-treaded casing is cemented and vulcanized as well as stitched it is claimed it will give additional mileage equal to or greater than the original tires. Two discarded casings are used, one with a good foundation of fabric and bead and the other with a good rubber exterior to be utilized as the tread. After an inch has been trimmed from its clincher edges, the improvised tread is placed outside of the fabric foundation and the two are firmly stitched together by the machine. Being laid in a perfectly normal position and supported by the end of the machine and two projecting rollers, the casing and tread cannot become distorted during the stitching operations.

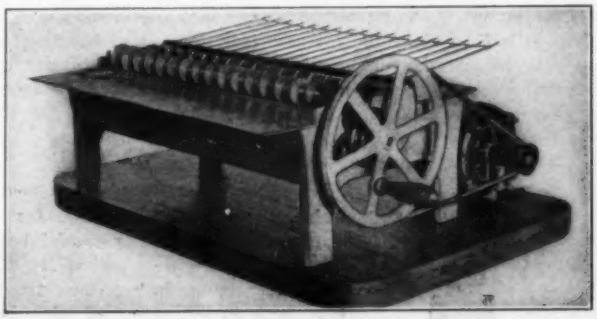


As the casing and tread are moved forward at each stitch, the needle and bobbin threads are passed through a lubricating wax solution to insure a uniform and tight lock stitch.

When repair patches are being sewed on tires, a lever at the top of the machine can be depressed to cause a reversal of the feed. The machine can be driven by either a one-horse power motor or by belting. [Singer Sewing Machine Co., New York City.]

TRABUE'S LABEL GUMMING MACHINE.

A label gumming machine fills a long-felt want among manufacturers who have been gumming or moistening dry gum labels by hand. Little attention has been paid to the up-keep



of the labeling department, but now that labor and materials are high, a machine of this sort should be welcomed by the trade.

These machines can be driven by hand or by small motors. They are made entirely of brass, except the reservoir, and this

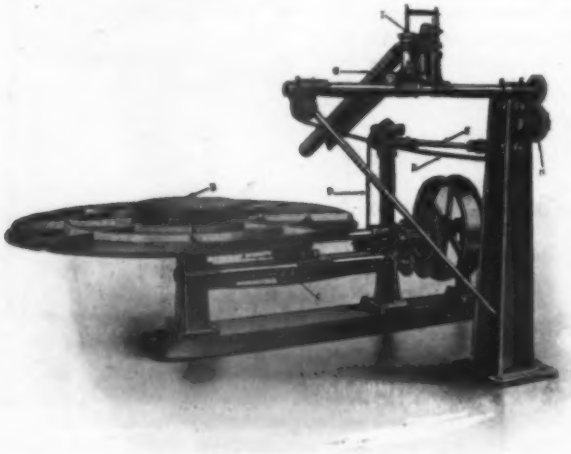
can be easily cleaned by putting into a bucket of water. The label or strip is drawn under the feed roller from the projecting horizontal table and passes out onto the receiving table ready for use.

By filling the reservoir with gum, the machine can be used to gum labels, and by using water, it can be used to moisten dry gummed labels. Where labels are to be put on packages or boxes such as those containing inner tubes and similar articles this gummer should prove a valuable adjunct to the factory equipment. It is made for labels or strips from ½ to 16¾ inches in width. [W. H. Trabue, 32 West 83d street, New York City.]

MACHINE FOR PANNING RUBBER COVERED WIRE.

This machine "pans" the wire after the rubber has been applied to it for insulation by the tubing machine, and handles all sizes up to No. 6 B. & S. gage.

Referring to the cut, *A* is the friction drive that revolves the pan *B* in which the rubber covered wire is coiled. The speed of



the pan is increased and decreased by the friction drive *A*, controlled by the screw *C*. Chain *D* is the drive for the knuckle joint shaft *E*, and brass tube *G*, through which the wire runs, is moved back and forth by chain *F*, while sprocket *H* drives the rubber feed rolls *I*.

The rubber covering machine and the above device are driven together so that when the variable speed cones are adjusted for the speed at which the wire is to be delivered, it will be coiled layer for layer in the pan. Then talc or soapstone is sifted over each layer, after which the covered wire is ready for vulcanization.

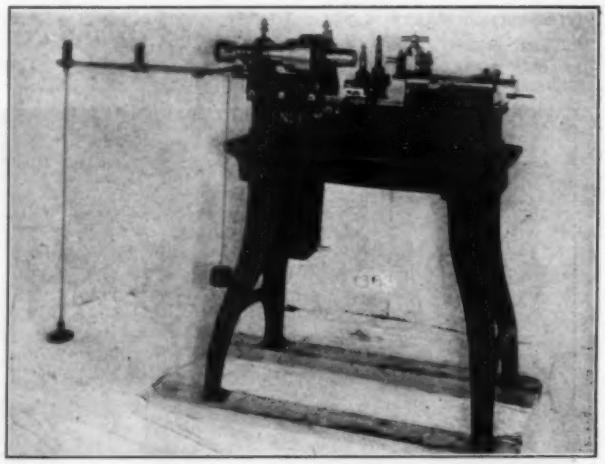
It is claimed by the inventor that the cost of handling wire may be materially reduced, and that a maximum output of a uniform product may be obtained. [T. J. Seward, Bridgeport, Connecticut.]

HYDRAULIC VALVE FOR RUBBER MILLS.

This hydraulic valve is constructed to withstand the hard usage of rubber mill work. It is made of a special bronze composition for pressures up to 2,500 pounds per square inch. There are only four parts to the valve; all parts being made extra large, the specially packed stem, large hand wheel or lever furnished makes the valve an easy one to operate. [Utility Manufacturing Co., Cudahy, Wisconsin.]

A GARVIN HARD RUBBER LATHE.

In the manufacture of hard rubber pumps, piping and fittings, the lathe here illustrated is frequently used. It is known as a No. 1 screw cutting lathe and has a plain turret head, automatic collet and a bar feed. Two solid floor legs support the bed of the lathe, which is of box form, and the pan which is fitted with double strainers, and oil or water reservoir. The spindle is hollow and will admit rods up to ⅝ inch in diameter, with the bar feed attachment, and rods 13/16 inch in diameter, without



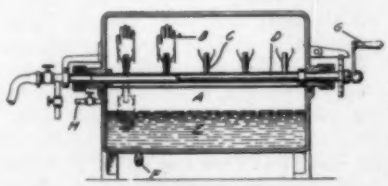
the bar feed. The collet that holds the work is opened and closed by a hand lever. When it is open the feed advances the rod through the spindle and against the stop in the turret head which determines the length of stock to be turned. The cross slide carries a front and back tool post and is operated by a hand lever. The turret head is 4⅝ inches in diameter and has six 11/16 holes for tools, it revolves by hand in either direction and long rods up to ½ inch in diameter can be passed freely through it.

The machine occupies a floor space of 42 x 22 inches and is driven by a three-step cone pulley from a double friction countershaft that is supplied with the lathe. [Garvin Machine Co., New York City.

MACHINERY PATENTS.

PRICE'S DIPPING AND VULCANIZING APPARATUS.

In this machine, the forms are dipped and then subjected to the action of a partial vacuum to aid in the evaporation of the solvent while at the same time they are heated from the inside to further increase evaporation.



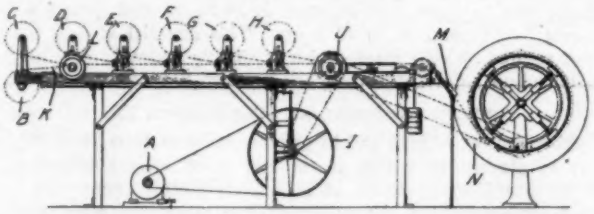
The accompanying cut shows a hermetically sealed chamber *A* in which the forms *B* are mounted on nipples *C*. Steam is admitted to the forms through the hollow support *D* and the rubber solution *E* is forced into the chamber through pipe *F*. The dipping, which is accomplished by turning the handle *G*, is repeated a suitable number of times before the rubber solution is withdrawn into a nearby container. At this stage a vacuum is produced through pipe *H*, the effect of which is to produce a very rapid evaporation of the solvent and drying of the coating on the forms.

By suitable connections and valves, pipe *H* may also be used to cause condensation of the volatile gases so that they may be recovered. A repetition of these operations will give the article on the forms the required thickness, after which heat may be introduced through pipe *H* for vulcanizing. [R. B. Price, assignor to Rubber Regenerating Co., Naugatuck, Connecticut, United States patent No. 1,169,733.]

TIRE FLAP MAKING MACHINE.

A simple and efficient apparatus for the manufacture of tire flaps is shown in the accompanying illustration.

The motor *A* rotates the fabric supply spools *B, C, D, E, F, G* and *H* by pulley *I*, sprocket *J* and chain drive to each spool. Upon the supply spool *B* is wound a strip of fabric *K* of a width

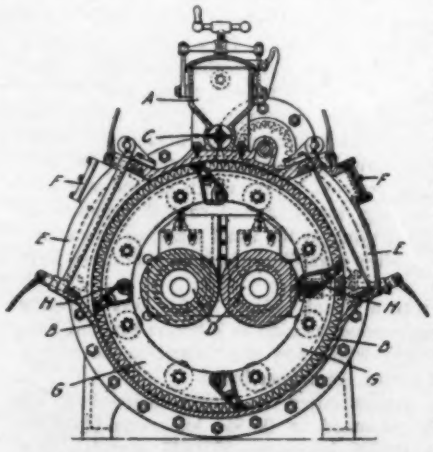


corresponding to the greatest width of the flap to be produced, and upon the supply spools *C, D, E, F* and *G* are wound strips of fabric decreasing in width while spool *H* carries a strip slightly less in width than the bottom layer *K* of the finished flap.

Fabric from roll *B* with the strip from roll *C* are introduced between the first feed roll *L* and its pressure roll, not shown, whereby the two are brought into intimate pressure contact. This process is continued at each spool until the resultant stock passes through tension rolls to guide *M*. As the fabric passes through the guide it is drawn into the cupping drum *N* and because of the concave shape of the bottom of the drum, will assume the desired transverse curvature which is fixed by curing. [W. C. Stevens, assignor to the Firestone Tire & Rubber Co., Akron, Ohio, United States patent No. 1,169,204.]

AUTOMATIC MIXING MILL.

Hoyt's mixer is designed to do away with considerable hand labor and also the necessity of an adjustable apron for collecting and returning to the rolls the ingredients that are not at first caught up by the rubber. The material that falls to the bottom of the chamber is scooped up by revolving blades and carried around so that it drops upon the mass being mixed. A further object is to subject the plastic material to a vacuum pressure during the mixing process.



The illustration is a cross-sectional view showing the arrangement of the various parts. The powdered compounding ingredients are put into feed hopper *A*, which is mounted on the cylindrical casing forming the main chamber *B*. A bladed shaft *C* then forces the material into the main chamber at a definite rate. The mixing rolls *D* are hollow and are provided with suitable connections for the inlet and outlet of steam and are revolved at slightly different speeds to give a grinding or kneading action to the material as it passes through. The doors *E*, which are hermetically closed, permit access to the interior of the casing and also permit inspection of the contents by means of the glass windows *F*. The device for conveying the material from the lower to the upper side of the rolls consists of two annular gears *G*, connected by rods to which are attached the paddles *H*. As the gears are rotated in a counter-clockwise direction the material is scooped up from the bottom, carried up on the right side of the chamber and then dropped to the rolls when the paddle has reached a position directly under the feed hopper. [Homer J. Hoyt, assignor to Morgan & Wright, United States patent No. 1,163,089.]

OTHER MACHINERY PATENTS.

THE UNITED STATES.

ISSUED JANUARY 25, 1916.

1,169,215. Electric car vulcanizer. E. H. Wiggins, assignor to D. A. Heyman—both of Chicago, Ill.

1,169,576. Portable repair vulcanizer. C. A. Shaler, Waupun, Wis.

ISSUED FEBRUARY 1, 1916.

1,170,178. Heel cutting apparatus. W. J. Nesbitt, Los Angeles, Cal.

1,170,383. Spreading machine for coating fabric with rubber or other like plastic materials. A. Wood, Uxbridge, England.

1,170,423. Collapsible core. W. R. Denman, assignor to Miller Rubber Co.—both of Akron, Ohio.

1,170,424. Collapsible core. W. R. Denman, assignor to Miller Rubber Co.—both of Akron, Ohio.

ISSUED FEBRUARY 8, 1916.

1,170,520. Cementing machine. F. E. Beverly, and J. W. Cosgrove, Medford, Mass., assignor to United Shoe Machinery Co., Paterson, N. J.

1,170,600. Apparatus for the vulcanization of pneumatic tires with non-skid leather treads. M. Bergougnan, Paris, assignor to Société Générale des Etablissements Bergougnan, Clermont-Ferrand, both in France.

1,170,612. Solid tire remover and replacer. H. A. Covery, assignor of one-half to F. C. Eberly—both of Akron, Ohio.

1,171,038. Repair vulcanizer. T. D. Gard, Kokomo, Ind.

1,171,143. Rotary drier. W. B. Ruggles, Bayonne, N. J.

THE DOMINION OF CANADA.

ISSUED NOVEMBER 30, 1915.

165,949. Fluid pressure mold with sheet of rubber. E. Lanhoffer, Poissy, Seine et Oise, France.

166,106. Slitting and rewinding machine. The Cameron Machine Co., assignee of J. A. Cameron and G. B. Birch—all of Brooklyn, N. Y.

166,266. Tire vulcanizer press. Goodyear Tire & Rubber Co., assignee of E. Nall—both of Akron, Ohio.

166,396. Mixer mechanism. P. E. Welton, Cuyahoga Falls, Ohio.

THE UNITED KINGDOM.

ISSUED JANUARY 12, 1916.

19,878 (1914). Insulated wire impregnating machine. W. Teggin, 7 Woodbine street, Moss Side, Manchester, and London Electric Wire Co., and Smiths Limited—both of 7 Playhouse Yard, Golden Lane, London.

ISSUED JANUARY 19, 1916.

30,378 (1914). Method of attaching covers to tennis or like rubber balls. E. C. Wisden-Luff, and Wisden Co.—both of 23 Cranbourn street, London.

THE FRENCH REPUBLIC.

PATENTS ISSUED (With Dates of Application).

477,474 (June 17, 1914). Hydraulic press for vulcanizing pneumatic tire casings. A. Wolber.

477,699 (February 13, 1915). Vulcanizer for repairing tires and other rubber goods. W. H. Melas.

477,719 (February 19, 1915). Improvements in processes and apparatus for rubberizing fabrics. F. A. Seiberling.

NEW MANUFACTURING PROCESS.

THE UNITED STATES.

ISSUED FEBRUARY 1, 1916.

1,170,154. Process of making tire casings. H. Hennig, Akron, assignor of one-half to A. Hauschild, East Palestine—both in Ohio.

THE HUNTER DRY KILN—A COMPARISON.

A ROOM for drying is a very important adjunct in the manufacture of rubber goods that in these days of competition and close prices are generally sold under a guarantee. It is well known that the materials, which make up the compounded rubber, must be intelligently prepared in order to produce reliable goods.

Many of the modern drying systems are highly inefficient and unsatisfactory because of the time and space required or the inferior quality of the stock after being dried. That the old drying principles are wrong is claimed by the Hunter Dry Kiln Co., Indianapolis, Indiana, in the following description and comparative tests of the Hunter process and dry kiln:

The kiln is constructed to bring about a rapid circulation of conditioned air by purely natural means, thus eliminating the possibility of mechanical disorder and lack of uniformity of conditions in the drying room. These conditions are automatically controlled, thereby making every day a perfect drying day regardless of atmospheric irregularities.

An ordinary dry room, perhaps, 85 feet long and 17 feet wide, with forced air circulating and condensing system, has a capacity of 14,000 pounds of dry rubber each 7 to 14 days, according to the moisture content of the crude material.

THE HUNTER DRY KILN.

A Hunter dry kiln is 18 feet wide and 35 feet long, inside measurement, and has a capacity of 15,120 pounds of rubber each twenty-four hours. This time allows from 6 to 9 hours for emptying and re-filling the room, the actual drying time being from 15 to 18 hours.

In order to arrive at a figure whereby the efficiency of the two systems may be compared, space, quantity and time must be taken into consideration. The ratio of efficiency will be inversely proportional to the product of the figures representing space, quantity and time of each system. Substituting the minimum time (7 days) of the dry room, and the maximum time (24 hours) of the dry kiln, the efficiency factor is:

$$\frac{\text{Dry Kiln}}{\text{Dry Room}} = \frac{15.7}{1}$$

Disregarding space and simply considering the possible capacity of each system under existing conditions, the output of the kiln is 7.5 times that of the dry room.

COMPARATIVE RUBBER DRYING TESTS.

The following comparative tests on washed and compounded stocks show interesting differences in favor of the dry kiln:

A batch of rubber was washed, careful attention being given to insure uniformity of mixing on the mills. Of the resultant crêpe sheet, one-half was dried in the regular dry room, and the other half was placed in the Hunter dry kiln. After drying, test batches were mixed from each of the samples, checks being kept on each one. The following data were the results obtained:

PREPARATION OF SAMPLES.

Dry Kiln	15 hours	Moisture.....	.079 per cent.
Dry Room	184 hours	Moisture.....	.28 per cent.

GREEN TESTS.

	Break. Pounds.	Stretch. Inches.	Efficiency.	Cure at 40 Pounds. Hours.
Dry Kiln	1,325	6.56	8,692	2½
Dry Room	1,275	6.12	7,802	2½
Dry Kiln	1,562	6.56	10,246.72	2¼
Dry Room	1,526	6.43	9,805.75	2½

AGED TESTS.

Samples of above cures were aged in circulating dry heated air for three hours at 235 degs F.

	Break. Pounds.	Stretch. Inches.	Efficiency.	Cure at 40 Pounds. Hours.
Dry Kiln	762	5.75	4,381.5	2½
Dry Room	525	4.75	2,493.75	2½
Dry Kiln	1,075	5.91	6,245.75	2¼
Dry Room	637.5	5.12	3,264	2½

	Moisture. Per Cent.	Sulphur Mix. Efficiency.	Oil Mix. Efficiency.
Dry Kiln	.21	1,510	1,720
Dry Room	.59	1,350	1,375
Dry Kiln	.30	1,675	1,800
Dry Room	.43	1,410	1,290

DRYING PONTIANAC.

When Pontianac is washed and milled in one-fourth inch sheets, it presents a dense, dough-like mass. After hanging these sheets in the dry room at 96 degrees F. for ten days, the stock presents a hard, brittle external crust of a creamy white color, and is apparently dry, but contains from 2½ to 4½ per cent moisture by test. The material is shown to contain 1.44 per cent of moisture after twenty-one days under the above conditions, and becomes so crumbly that it is difficult to handle. However, when placed in the dry kiln, Pontianac is dried from 0.75 per cent to 1 per cent moisture in 38 hours, and from 0.3 per cent to 0.5 per cent in 48 hours. This material is then a brown colored, flexible mass, which is slightly tacky, is easy to handle and not injurious to the stock in which it is used.

DRYING COMPOUNDING INGREDIENTS.

Zinc, lithopone, whiting and barytes are dried in from 24 to 90 hours by placing the barrels in the kiln in an upright position and permitting a circulation of air on all sides. These compounds, especially zinc, and lithopone, after being thus dried, do not form in sticky lumps which are hard to pulverize, but powder very readily through the sieve, and seldom cake on the mixing rolls.

DRYING CEMENTED SURFACES.

Two to three hours, depending largely upon weather conditions, are required to dry the cement on inner tube splices and valve bases. In the dry kiln this operation is accomplished perfectly in 25 minutes. Life is apparently given to the cement by this process, and tight, firm splices are the result.

In the construction of double operation motorcycle casings, it has been the custom to paint a heavy coating of cement on a carcass, and a period of from three to five hours was required before the cement was sufficiently dry to permit of the application of the tread. By the Hunter process, however, the carcass is ready for the application of the tread after one hour in the dry kiln, and this period can be shortened if necessary.

All of the above data was taken under actual working conditions.

THE AMSTERDAM CRUDE RUBBER MARKET IN 1914.

Official industrial and commercial reports of the Netherlands for 1914 have recently been published. They contain interesting facts relating to the effect of the war on the Amsterdam crude rubber market during the first five months of the war.

The year 1914 opened very favorably for the Amsterdam rubber market; business was active and the number of buyers increasing. War came early in August and, from then on, very little crude rubber was received. That which arrived was sold without the usual sorting, sampling and careful examination, thereby preventing the levying of the usual taxes, as it was impossible to determine values regarding which no indications were available.

Prices increased with a bound. *Hevea* rubber was especially sought for and brought prices as high as 7 florins per half kilogram [$2.55 per pound], which was about equal to the highest prices paid in 1910, during the rubber boom.

Shipments which arrived after the stocks included in the auction of July 29, amounted to 499,956 kilograms [1,099,903 pounds], of which 418,924 kilograms [921,633 pounds] were *Hevea;* 61,543 kilograms [135,395 pounds], plantation *Ficus;* 8,255 kilograms [18,161 pounds], *Castilloa;* 1,384 kilograms [3,045 pounds], *Manihot* and 9,850 kilograms [21,670 pounds] of various kinds of forest rubber.

The Editor's Book Table.

TECHNOLOGIE DER KAUTSCHUKWAREN. BY DR. KURT Gottlob. Frederick Vieweg & Sohn, Braunschweig, Germany. 1915. [Large 8vo, 256 pages, 92 illustrations.] Published in German.

THIS work is the tenth volume in a series known as "New Handbooks of Chemical Technology" under the editorship of Dr. C. Engler, of Karlsruhe.

The author in his preface states that his object is to supply the technical man with knowledge of the scientific aspects of the rubber industry and the fundamental principles of rubber manufacture, as applied in typical classes of goods. He has also endeavored to aid practical rubber men to correlate their personal experience and observation by a comprehensive treatment of the industry.

No attempt is made to explain the details of manufacture, nor is the question of manufacturing costs treated. The aid of able specialists has been enlisted in the preparation of certain chapters, and thus the value of the discussion of various important topics is enhanced.

The book follows a natural order of arrangement, beginning with historical matter and the chemistry of pure rubber. The work is divided into two parts, general technology and special technology of rubber goods.

In the first section the origin, gathering, washing and drying of crude rubber are treated, together with a chapter on resins and albumens. Tests of crude rubber are given, and the subjects of mastication, fillers, mixing and calendering are considered. Under chemistry and methods of vulcanization is a resumé of the work of the leading chemical investigators of this phase of rubber manufacturing. The technical operations of vulcanization, hot and cold, methods of analysis, tests and apparatus for chemical and physical examination of vulcanized rubber are also given careful attention. The chapters devoted to the tests for crude rubber, and on analysis and testing, are written by Dr. E. Kinscher.

In the second section of the book, which is devoted to the special technology of rubber manufacturing, two chapters are devoted to cold cured goods and seven to hot cured. Under cold cured goods, the chapter on cut sheet is written by E. Herbst, of Vienna, and includes governmental regulations on the plan and equipment of cold cure plants. The author of the volume wrote the chapter that follows on seamless rubber goods, which treats of solvents, dipping, etc.

Under hot cured goods the subject of mechanicals is treated by Mr. Herbst and the author, who review the applications of rubber and discuss the proper arrangement of rubber factory workrooms. K. Miksch, of Petrograd, contributes a chapter on rubber heels and rubberized fabric in which the various processes of manufacture are described. Rubber toys are discussed by Dr. Dorogi, of Budapest, who tells of the principles of manufacturing and finishing these products. Two chapters by Mr. Herbst are devoted to all types of solid and pneumatic tires and anti-skid devices, and to the manufacture of rubber footwear. The final chapter is on hard rubber, and is prepared by Engineer Ballog and the author.

TRANSACTIONS OF THE RUBBER GROWERS' ASSOCIATION, 1915, London, England. The Rubber Growers' Association. [Paper 41 pages.]

This is the seventh report of the Council. It comprises lists of the officers, committees, the members and the representatives of the Association on committees of the Rubber Trade Association of London; also officers and committees of the International Association for Rubber Cultivation in the Netherland Indies. The membership of the Rubber Growers' Association has rapidly increased since organization in 1908; it now includes 412 company and 250 individual members. During the past year (1915) the activities of the Association have expanded with the importance of the rubber growing industry and in consequence reorganization of the Association has been necessitated.

The administration of the Malay and Ceylon Research Funds has been assumed. The work of these funds has greatly benefited the plantation rubber industry by chemical and botanical research. The work of each of the association committees is detailed in the body of the report. Record is made of many gifts made through the Association to the British War Department, of much equipment such as an ambulance, 4000 life saving collars for the Australian navy, rubber boots to the Royal Flying Corps, cushions and pads and rubber flooring to various hospitals.

AGRICULTURAL BULLETIN OF THE FEDERATED MALAY States. Department of Agriculture F. M. S. Kuala Lampur. 1915. [Monthly parts 50 cents each. Annual subscription $5.00.]

This publication is the organ of the above mentioned department and of the Planters' Association of Malaya. In it is published a wide variety of scientific and statistical reports relating to tropical agricultural interests, notably rubber and other important plantation products. The papers record the laboratory and field investigations of the large scientific staff of the Federated Malay States department of agriculture.

Notable among the published papers of the past year is the series by B. J. Eaton and J. Grantham entitled "Vulcanization Experiments on Plantation Rubber," an important study of the influences affecting the standardization of plantation *Hevea* as regards curing quality and physical characteristics after vulcanization.

STUBBS' BUYERS' DIRECTORY FOR THE WHOLESALE DRUG, Chemical and Allied Trades, 1916. Alfred Stubbs, 30 Cliff street, New York City. 1916. [8vo, 350 pages. Price, $3.00.]

The revised and enlarged edition of this trade directory is a valuable reference book for the purchaser of drugs and chemicals. It comprises two sections, both arranged alphabetically by materials. The first section contains a list of manufacturers and first-hand dealers in drugs, chemicals, essential oils, laboratory machinery, etc.; and the second a similar list relating to druggists' sundries, glassware, etc.

Many of the articles listed are of interest to the rubber chemist and compounder who will find the directory of practical value in locating sources of supply.

DICTIONARY OF TEXTILES. BY LOUIS HARMUTH. FAIRCHILD Publishing Co., New York City, 1915. [Cloth, 8vo, 174 pages. Price, $5.]

This dictionary, the result of over seven years of collecting and compiling, contains the definitions of over 6,600 terms relating to textile fibers and fabrics. These are arranged in alphabetical order, each term being discussed independently. While essentially designed for those engaged in the textile industry, rubber manufacturers will find it a helpful reference.

PREDICTS 200,000 TONS OF HEVEA RUBBER IN 1919.

Basing the average production of *Hevea* rubber at 400 pounds per acre, it was estimated at a meeting of rubber planters held in Bandong, Java, that the world's production of *Hevea* rubber in 1919 would amount to 200,000 tons.

A RUBBER BRAKE FOR ROLLER SKATES.

One of the latest safety devices in which rubber is employed is a guard for roller skates, to prevent the skater from tipping backward. This is in the form of a steel, rubber-tipped apron, which extends from the top of the heel or counter of the skate to within a very short distance of the floor. Should the skate suddenly attempt to fly out in front of the wearer, the rubber tip comes in contact with the floor and prevents a bad fall.

New Goods and Specialties.

THERMO STEAMING BAG.

MOIST hot compresses are of great benefit in many cases of sore muscles, stiff joints, for reducing purposes, complexion improvement, etc. The old method of application by means of towels dipped in hot water is troublesome, and only partially effective. The towels need constant replacing, as they do not properly retain the heat.

The novel device shown in the accompanying illustration combines a hot water bag and steam compress, a soft cloth pad being fitted in a pocket made in the bag. In this manner moist heat may be retained for a considerable period, avoiding all the annoyance of the old method and giving better results. These steaming bags are supplied in five sizes, from 4½x6½ inches, designed to apply to a small space, for tooth, ear or headache, to 5x17 inches, suitable for tying around the face, neck, or even the arm or leg, if required. [Dr. Jeanne Walter, New York City.]

DROP BOTTLE WITH RUBBER CAP AND BULB.

In using the ordinary dropper and medicine bottle it is difficult to keep the dropper in a sanitary condition. When left outside the bottle it should be washed off each time, before and after using, and placed in a tumbler or other receptacle; and even when the bottle is adapted for holding the dropper in place of a cork, it is by no means as convenient a method as the device here illustrated affords. The bottle and dropper are combined in the form of a glass receptacle with a spout and rubber bulb top, and by this means medicine and liquids of all kinds may be dispensed with perfect cleanliness and ease. A small rubber cap is also provided for closing the dropping end when not in use. [J. Austin Dunn Specialty Co., Chicago, Illinois.]

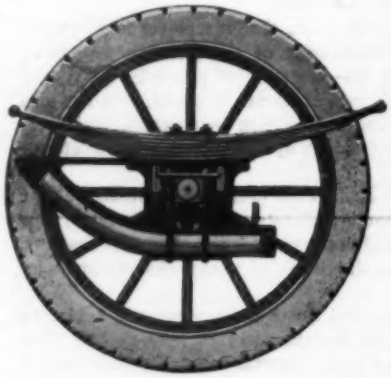
THE GOODRICH SAFETY RESPIRATOR.

In mines, vaults and places where the air is foul or dust-laden, the health of workmen is menaced to a dangerous degree. But the modern employer is alive to the fact that safeguards for the health of employes are an economic necessity, and the respirator here illustrated is of interest as an effective means of eliminating danger in many occupations where the kind of protection it affords is necessary.

This appliance consists of a well-molded, perforated outer casing of rubber, provided with adjustable straps, which allow for comfortable fitting over the mouth and nose. The interior contains a sponge, which may be used dry or saturated with water or any medicated preparation as required. [The B. F. Goodrich Co., Akron, Ohio.]

THE JONES PNEUMATIC TIRE SPRING.

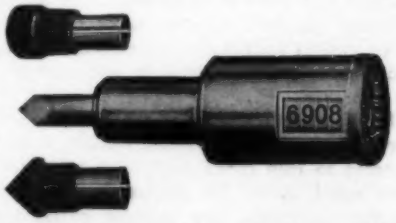
The Jones pneumatic tire spring utilizes the principle of a pneumatic cushion used in conjunction with the spring of an automobile. It consists of a shoe and inner tube made in the same manner as the usual pneumatic tire and is installed so as to act between the axle and springs of a car as shown in the accompanying illustration to reduce vibration and shock. Adjustments to various weights are made by inflating or deflating.



This device is claimed to make riding easy and pleasant and to permit the substitution of solid tires on the wheels, thus eliminating the troubles common to pneumatic tires. [The Jones Pneumatic Tire Spring Co., New York City.]

THE VEEDER CLUTCH SPEED COUNTER.

The illustration shows the Veeder clutch speed counter, a convenient instrument for determining revolutions per minute made by a shaft or other revolving part. One of the rubber cushion caps is placed on the spindle of the counter, and the counter is pressed against the end of a shaft, causing the spindle to revolve and the counting device to register. Speeds as high as 5,000 r.p.m. can be safely measured. Two rubber tips, one pointed and the other flat, are furnished with each instrument. [Veeder Manufacturing Co., Hartford, Connecticut.]



THE "DU-TELL" PUNCTURE FINDER.

It is sometimes not easy to locate the small puncture in a tube which a nail or sharp stone can inflict. A common method is to partially submerge the tube in water so as to discover the leak from the resulting air bubbles. But this method entails considerable trouble and delay.

The "Du-Tell" device here illustrated is designed to locate these elusive leaks with the least possible trouble. It consists of a nickel plated frame or box, curved to conform to the tread of the tire. On the under side is a fine mesh screen, and on top a transparent protecting celluloid window. On the screen are small fingers made of very thin cork shavings.

The puncture is located by placing the finder tightly against the tire and sliding it around, meanwhile observing the pieces of cork, which will fly up against the celluloid when the leak is reached. [J. W. Anderson, New York City.]

A DAINTY RAINCOAT.

Owing to the scarcity of dyes, rubber manufacturers are favoring styles that do not require the colors that are costly and hard to procure. The result has been some pleasing novelties.

Photo Underwood & Underwood.

The raincoat shown in the illustration is notable as a triumph of the rubber worker's art in proofing. Hitherto such garments have been unattractive, as regards color. Here, however, a remarkably pleasing color effect has been secured which rivals the colored raincoats known as slickers. The material employed in the illustration shown is Japanese mummy silk proofed on the outer surface with white rubber. The garments are made in a variety of pale colors such as white, green, rose and blue. It is possible that the new garment will rival in popularity among collegians the oiled silk raincoats introduced last season. This coat will certainly be appreciated as much for its dainty appearance and light weight as for its utility and will entirely remove the dislike that many women entertain for raincoats. [Harris Raincoat House, New York City.]

"ON THE LEVEL" RUBBER HEEL.

Rubber heels usually wear down on one side, causing discomfort in walking and having to be renewed while there is still a portion of the surface comparatively unworn. The new type of revolving heel here shown does away with this disadvantage by an ingenious device.

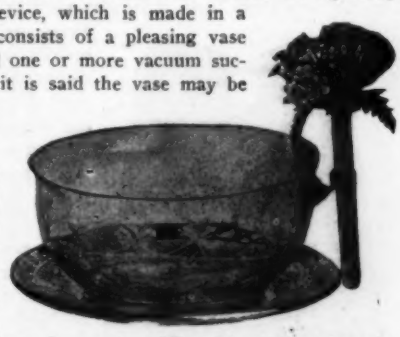
The revolving portion, in circular form, is sunk in a flat rubber casing, which forms a frame at the forward end. The heel is attached to the shoe with cement and three nails, one in the center of the circular piece, which turns on a grommet with the pressure of the shoe on the ground. In this way the surface of the heel remains level, wearing evenly, and consequently outlasting the ordinary heel. [E. S. Helwitz, New York City.[

THE 1916 "GOODRICH CHAMPIONSHIP" TENNIS BALL.

The Goodrich tennis balls have long been esteemed by tennis players, who appreciate the heavy, close-woven, high grade felt surface for the racket to bite into. The cover is sewed by a hand under-stitch, the gilling is strong, and the stitches are close. Every ball is guaranteed a rebound of 50 to 60 per cent on a 100-inch drop. The output is gaged to the actual demand so that fresh, live balls are always supplied. [The B. F. Goodrich Co., Akron, Ohio.]

THE "VACU-VAS" FOR FLOWERS.

In these days, when floral decorations are playing an important part in many homes the "Vacu-Vas" should be especially appreciated. This device, which is made in a variety of designs, consists of a pleasing vase to which is attached one or more vacuum suction cups by which it is said the vase may be securely attached to a mirror or to varnished woodwork.



Flowers displayed in this manner may be placed in such position as to obtain the best decorative effect. The "Vacu-Vas" may be placed against the glass of an automobile without fear that the jolting of the car will lessen its adherence. [Daniel Low & Co., Salem, Massachusetts.]

THE RUBIN DUPLEX WATER BOTTLE.

The accompanying illustration shows a water bag so constructed that an infant's nursing bottle can be placed within a central opening and its contents thus kept at the desired temperature. If filled with hot water the bag holds the bottle in a warm pocket until required, while during the hot season, when babies are taken to the park or visiting, the bag may be filled with ice water or chopped ice to prevent souring the milk.

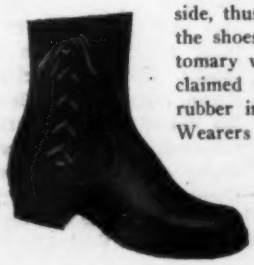
The advantages of this device are many. The weight of the nursing bottle fixed in this manner is too great for a baby to throw it out of the crib or carriage—a common habit—and the bag forms a support for the bottle, which prevents it from rolling under the baby's head or body. If a ribbon or bandage is passed through the opening, the water bag may be attached in a stationary position to any part of the body. [The Vulcalose Co., Chicago, Illinois.]

WATCH HOLDER FOR STEERING WHEEL.

The automobilist is usually running against time and the old dashboard clock has frequently proven unsatisfactory. The device shown is a jet-finished holder and rubber cushion for a watch. This is attached directly on the steering wheel, the rubber cushion preventing vibration. These holders are made to fit any watch and any steering wheel. [Motor Car Specialties Co., Boston, Massachusetts.]

"BUDDY" INSIDE LACE PACS.

The "Buddy" inside lace pacs are new half boots of rubber that lace on the inside, thus preventing the laces from cutting the shoes and making them leak, as is customary with those that lace in front. It is claimed that these pacs are made of pure rubber in a way that tends to resist wear. Wearers appreciate the ease with which they are laced, which is conveniently done by placing the foot across the knee. [Beacon Falls Rubber Shoe Co., Beacon Falls, Connecticut.]



RUBBER-COATED PATIENTS' BIB AND LABORATORY APRON.

The first illustration shows a bib that is specially designed for convenience, complete protection, and quickness of adjustment in the sick-room, and it is also very practical for dental use. There are no strings, clamps or buttons to get out of order—simply a spring which adjusts itself and saves the necessity of tucking a towel around the neck. These bibs are 28 inches wide and 36 inches long, and are made of high-grade white cloth, heavily coated with rubber. They can be had in white, black, or maroon.

In the convenient and thoroughly practical laboratory apron, also shown, two self-adjusting spring attachments (marked *A* and *B*) serve the same purpose as the one in the bib and do away with annoying and time-consuming fastenings. It is made of heavy, rubber-coated sheeting, universal size, and of the same colors as the bib. [Frank Betz, Hammond, Indiana.]

SILK OUTING PUMP.

Within the last few years outing shoes have undergone a remarkable transformation. With the spread of interest in athletic sports, especially among women, comfort, combined with good looks and variety in style, have been added to the old requirement of mere utility.

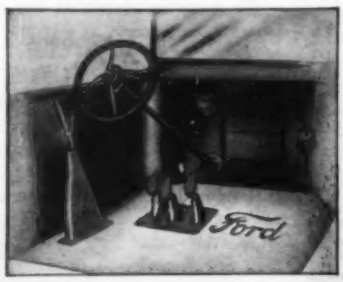
A recent development is the outing pump of silk, with white rubber sole and heel and neatly tailored bow or plain colonial buckle. The pump here shown is of black silk, but they are also supplied in white, blue and other pleasing and fashionable colors. [Converse Rubber Co., Malden, Massachusetts.]

THE "BI-PLANE" SIDEWALK COASTER.

Sidewalk coasters are a source of never-ending amusement for children, and their use does not overtax the muscles, as in the case of many childish sports. The rider stands on the platform between the wheels and pulls the handle back and forth, slight effort being required to run the coaster. The new model here shown, called the "Bi-Plane," has 10-inch, full ball-bearing, rubber-tired wheels, with spokes set into the rims with nipple bolts. Finished in maroon enamel, striped in silver, it forms a durable and highly attractive plaything. [F. A. O. Schwarz, New York City.]

FORD AIR BREAK.

In a Ford car the openings at the clutch and brake are very large. This, as well as the fact that there is no pan under the car, permits the air to come through at these points in such volume as to render the driver's position one of considerable discomfort, at any season of the year.



A contrivance to overcome this unpleasant feature is shown in the "Ford Air Break" here illustrated. The openings are encased in a covering of specially prepared double texture material which is very strong and heavy and which effectually prevents the entrance of air. [Franklin Rubber Co., Boston, Massachusetts.]

RUBBER TATTING SHUTTLE AND THIMBLE.

Tatting, which is the name for attractive, lace-like designs worked in fine thread and used as edgings and trimmings, is coming again into popularity after years of comparative neglect. This work demands a special shuttle, and the first illustration shows a new tattling shuttle of highly polished black hard rubber.

Lightness is an important feature in the hard rubber thimble, also shown. It is claimed for this thimble that it will not tire the finger of the user. It is inexpensive and durable, and is supplied in all the standard sizes. [American Hard Rubber Co., New York City.]

WORK SHOE WITH RUBBER HEEL AND ROCKER BAR.

Improvements are constantly being made to meet the demand for shoes that will be waterproof, possess unusual durability, and yet not burden the feet of the wearer unnecessarily with their weight and clumsiness. A recent candidate for favor utilizes aluminum for the lower portion of the shoe, thus providing a strong waterproof shoe of the minimum weight, while the solid rubber heel and rocker bar, here shown, are to provide comfort, both in standing and walking. [Racine Aluminum Shoe Co., Racine, Wisconsin.]

RUBBER SEWING FINGER.

In sewing, especially when working with heavy, unwieldy materials, it is not only the thimble finger that suffers if unprotected. The forefinger is apt to be pricked and becomes callous and sore. A convenient protection is shown in the rubber sewing finger here illustrated. Ventilation at the small end avoids sweating or drawing, while the inside ribbing holds it securely on the finger. When counting bills or handling papers of any sort, the operation will be greatly facilitated by the use of these rubber fingers with the ribbed side turned outward. They are made in three sizes, small, medium and large. [C. J. Bailey & Co., Boston, Massachusetts.]

The Obituary Record.

CHARLES H. ARNOLD.

CHARLES HENRY ARNOLD, for years a leading figure in the crude rubber business, died at the Hotel Manhattan, New York City, February 20. He had been an invalid for over a year, having never fully rallied from a severe attack of pneumonia. Some three weeks ago he left his home in Stoneham, Massachusetts, and came to New York to arrange certain business affairs prior to a visit to Augusta, Georgia. The effort was too much for him in his enfeebled condition, and the end came from physical exhaustion.

CHARLES H. ARNOLD.

Mr. Arnold was born in Roxbury, now a part of Boston, November 14, 1860. He attended the Boston public schools, and when 14 years of age entered the employ of Henry A. Gould, who was then a Boston commission merchant. Soon after Mr. Gould began to import gutta percha, and later india rubber. Both of these commodities were sold to rubber manufacturers by the enterprising young clerk.

During his visits to the rubber factories he met Colonel N. Chapman Mitchell, who was just beginning the reclaiming business that later became the great Philadelphia Rubber Works Co. With Mr. Gould's consent, Mr. Arnold began on his own account to purchase "gossamer" rubber scrap from the Conants, Klous, Columbia, Mystic and other New England factories, having it reclaimed and reselling the product.

This became so profitable that at the age of 21 he embarked in business for himself under the firm name of C. H. Arnold & Co., with Frank H. Atwood as partner, selling gutta percha and reclaimed rubber. This business prospered, but in 1894 he liquidated it and became Boston representative of the firm of Reimers & Meyer, later Reimers & Co. On the retirement of Hermann Reimers in 1903 the firm of Poel & Arnold was formed, representing Heilburt, Symons & Co., of London, the headquarters being in New York City. In 1911 Mr. Poel retired, and the firm name was changed to Arnold & Zeiss, which it has since remained.

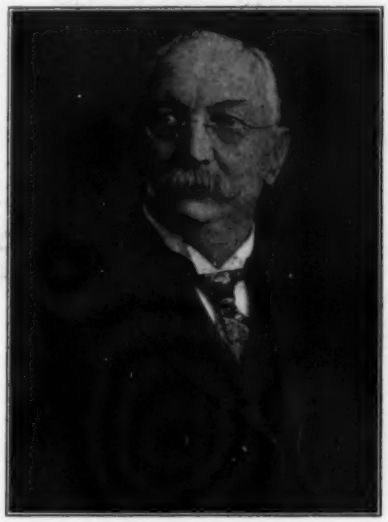
Mr. Arnold was widely known and universally respected by the rubber trade at home and abroad. A man of marked individuality he impressed all with his sturdy common sense, rigid uprightness and uncompromising fairness. Serious and often reserved, he nevertheless made firm friends, and where he gave his own friendship it was loyal, frank and enduring.

Of the five sons who survive him two are connected with the rubber trade: W. H. Arnold, who is the Boston representative of Arnold & Zeiss, and H. C. Arnold, who is the assistant superintendent to the Converse Rubber Shoe Co.

In accordance with Mr. Arnold's last wishes the funeral services held at his home in Stoneham, Massachusetts, were of the simplest character. Many prominent men in the rubber trade were present, including members of the Rubber Club, Mr. Arnold having been one of the founders of the New England Rubber Club, a charter member of the Rubber Club of America, and a director in both organizations.

JAMES H. McKECHNIE.

James H. McKechnie, president of the Canadian Consolidated Rubber Co., Limited, Montreal, Canada, died at his residence in that city on February 8 after an illness of ten days.



JAMES H. McKECHNIE.

Mr. McKechnie was born in Granby, Quebec, in 1849. He received a public school education and early in life was engaged in a general store business. While interested in a saw mill near Granby he went to Montreal to arrange for a purchase of rubber belting. Visiting the Goodyear store, he noticed a large quantity of gossamer coats that had been made in the States. He obtained his belting and also a suggestion that resulted in the large business he later developed.

When he returned to Granby he started a factory for making gossamer coats. That was in 1877. In 1883, in company with the late S. H. C. Miner and others, he organized and became general manager of the Granby Rubber Co., Limited. This corporation, as every one knows, was very successful and had built up a large and profitable trade when it was merged with the Canadian Consolidated Rubber Co., Limited, and Mr. McKechnie became a vice-president. In April of last year he was made president of the company and since that time he was elected president of the Canadian Consolidated Felt Co., Limited.

For nearly two score years, Mr. McKechnie devoted his time and energies to the study of the rubber industry. Much of the remarkable success of his undertakings is due to his indomitable will and indefatigable energy. A number of improvements in rubber footwear have been the result of his inventive genius. His keen foresight and wise judgment have been recognized as a benefit to the companies with which he has been associated. Mr. McKechnie possessed sterling qualities and his noble character exerted an influence not only on business conditions, but on the community in which he lived. He stood for courage, integrity, intelligence and prudence, and his death is mourned by many personal and business friends.

SIR CLEMENTS ROBERT MARKHAM.

Sir Clements Robert Markham, K.C.B., F.R.S., F.S.A., D.Sc., late president of the Royal Geographical Society, the distinguished scientist, who was prominent in the movement that developed rubber cultivation in the East, died at his home, London, England, on January 30, aged 85 years.

Born at Stillingfleet in Yorkshire, England, on July 20, 1830, of a noted naval family, he entered the navy in 1844. After eight years of service, during which he visited Peru, and also took part in the expedition of 1850-1, that searched for Sir John Franklin, he resigned his commission in 1852 to devote himself to travel and scientific investigation. While in Peru in 1852-4, he became acquainted with the *Cinchona* trees yielding quinine, and with *Siphonias* (*Heveas*), yielding rubber. He introduced the cultivation of *Cinchona* into British India in 1859-62, with the result that the price of this drug was reduced from one pound to one shilling an ounce in London, and it became available for general use.

Photo by Rain News Service.

SIR CLEMENTS R. MARKHAM.

From 1858-87 Sir Clements served as assistant secretary in India. It was during this period that his rubber activities are of interest. According to an article contributed by him to the March, 1894, issue of THE INDIA RUBBER WORLD, he came to the conclusion in 1870 that it would be desirable to establish plantations of *Ficus elastica* in British India, and also to introduce the best yielding plants from South America.

The first step was the planting of native Indian trees in Assam and other parts. He also planned for the introduction of South American varieties yielding better rubber. He decided that the *Castilloa* seed should first be obtained as these plants throve in a greater variety of soil and climate than the *Hevea*. The collecting of the needed *Castilloa* plants and seed—a difficult task—he assigned to Robert Cross, who, in 1875, gathered six hundred young plants of the best species. Again in 1876 Mr. Cross was sent to Brazil where he collected 1,080 *Hevea* plants. H. A. Wickham gathered 70,000 seeds the same year. Mr. Cross also proceeded to Ceará where a few young *Manihot* plants were collected together with 700 seeds.

Sir Clements hoped that *Castilloa* trees would find a congenial home in western Ghats, that *Hevea* would thrive in Burma and that Ceará would be extensively grown in the drier plains of India.

His watchful attention to the subject of rubber cultivation had much to do with the establishment of the eastern plantations.

He was secretary from 1863-88, and president from 1893-1905 of the Royal Geographical Society. He wrote books on various subjects as well as editing 25 volumes. His recreation was traveling and topographical research. Sir Clements was Commander of the Order of Christ, Commander of the Pole Star of Sweden and of St. Olaf of Norway.

MORIZ JOSEF REITHOFFER.

Moriz Josef Reithoffer, senior member of the firm of Josef Reithoffer's Söhne Gummi- und Kabelwerke, Vienna, Austria, one of the pioneers in the Austrian rubber industry, died at Vienna, on December 14, 1915, aged 77 years.

Mr. Reithoffer, together with his brothers, Gustav and Robert, in 1856, continued the small rubber textile business which his father had started in 1832. From a very small workshop in an old residence in the suburbs of Vienna, there was developed the large rubber manufacturing business that today employs many hundreds of hands in its factories at Garsten and Pyrach, near Steyr, in Upper Austria, and at Treucsein, in Hungary, where soft rubber articles, insulated wire and cables, tires and general mechanical rubber goods are manufactured.

For years a leading figure in Austrian industrial and commercial circles, Mr. Reithoffer was a "counselor of commerce," a title conferred only on distinguished financiers and men of large business. He possessed exceptional ability, a fine character and strong personality.

RICHARD S. BRYANT.

Richard S. Bryant, factory manager of the Standard Welding Co., Cleveland, Ohio, died at the Post-Graduate Hospital, New York City, on January 28, aged 46 years.

Mr. Bryant was an authority on automobile rims, of which he invented several special types. He organized the Bryant Rim Co., Columbus, Ohio, which was later absorbed by the Diamond Rubber Co., Akron, Ohio. He was then appointed consulting engineer of the United Rim Co., of Akron, a holding company for several rim patents owned by large rubber companies. Later he became consulting engineer of the Standard Welding Co., and also its factory manager. Mr. Bryant was a member of the Standards Committee of the Society of Automobile Engineers.

TH. L. A. RUNGE.

Th. L. A. Runge, said to be the first to introduce rubber planting in Sumatra, died on December 28, 1915, in Hanover, Germany, from injuries received in a street car accident. In 1890 he planted "Boeloe" *Ficus* on the west coast of Sumatra, and in 1900 introduced *Hevea* into his plantations. Two years ago he took up his residence in Hanover, but retained the management of his plantations.

HOLLAND PROHIBITS RUBBER EXPORTATION.

A royal decree issued on January 27, 1916, prohibits the exporting of rubber from Holland. It is understood that this measure will result in Great Britain ordering no further interference with shipments of rubber to Holland. Heretofore rubber cargoes have been held up until it was conclusively proved that they were not consigned to German agents in the Netherlands.

RUBBER CLUB ANNOUNCEMENT REGARDING EXPORTING.

It has been announced by the Rubber Club of America, Inc., that it has recently come to the attention of its Rubber Advisory Committee that some export managers are not familiar with the provisions of the British Rubber Guarantee with respect to export shipments of manufactured rubber goods.

Many manufacturers have obtained lucrative export orders from Scandinavian countries on the express stipulation that the goods be shipped by direct steamer. Members of sales organizations will often go ahead with such orders in evident ignorance of the guarantee which the executive head of their firm has signed, and it is only when they find that the steamship company refuses to take the goods that they come to a proper understanding of the situation.

It makes no difference who the customer in the neutral European country may be, whether it be the Government of that country or anyone else, for under Great Britain's restrictions, all rubber goods must be shipped to a consignee in the United Kingdom and a license obtained from the War Trade department in London for reshipment therefrom.

News of the American Rubber Trade.

THE KELLY-SPRINGFIELD TIRE CO. REPORT.

THE annual report of the Kelly-Springfield Tire Co., New York City, for the year ending December 31, 1915, shows very gratifying profits. The statement in detail is as follows:

STATEMENT OF INCOME AND PROFIT AND LOSS.

Gross profits	$2,880,080.06
Less: Operating expenses, including selling, administrative and general expenses	1,195,873.81
Net operating income	$1,684,206.25
Other income, net: Cash discounts, interest and miscellaneous	22,537.52
Net income for year	$1,706,743.77

BALANCE SHEET.

ASSETS.

Cash in banks and on hand		$705,051.33
Notes receivable		104,227.20
Accounts receivable	$1,261,238.73	
Less reserve for bad debts and discounts	143,556.40	
		1,117,682.33
Inventories at cost		1,624,607.92
Deferred charges to operations		30,036.29
Current assets		$3,581,605.07
Sinking fund on debenture bonds: Cash and debenture bonds purchased		131,750.82
Sinking fund for redemption of first preferred stock		82.00
Treasury stock—6 per cent first preferred		86,800.00
Plant accounts, good will and patent rights, less reserve for depreciation		7,807,523.45
		$11,607,761.34

LIABILITIES.

Accounts payable		$60,172.13
Accrued charges		52,849.77
Dividends and interest payable:		
1¾ per cent on first preferred stock issued, due January 2, 1916	$56,373.00	
1¾ per cent on second preferred stock issued, due January 2, 1916	1,874.25	
Interest of 4 per cent on income debenture —bonds outstanding, due April 1, 1916	10,800.00	
		69,047.25
Current liabilities		$182,069.15
Fifty-year sinking fund 4 per cent income debenture bonds		270,000.00
Capital stock:		
6 per cent first preferred	$3,758,200.00	
7 per cent second preferred	72,600.00	
Common	4,834,600.00	
		8,665,400.00
Sinking fund for redemption of stock and bonds:		
6 per cent preferred stock	$150,328.00	
4 per cent income debenture bonds	142,550.82	
		292,878.82
Reserve for bonus distributions		70,674.38
Surplus and working capital per annexed statement		2,126,738.99
		$11,607,761.34

SURPLUS AND WORKING CAPITAL.

Balance, January 1, 1915		$1,134,639.15
Additions during year:		
Dividend declared on treasury stock	$1,302.00	
Profit on purchase of 6 per cent first preferred stock	11,718.00	
		13,020.00
Balance as adjusted		$1,147,659.15
Net income for year ended December 31, 1915		1,706,743.77
		$2,854,402.92
Less:		
Quarterly dividends on—		
First preferred stock, 6 per cent	$225,492.00	
Second preferred stock, 7 per cent	46,490.50	
Common stock	265,578.00	
	$537,560.50	
Interest of 4 per cent on income debenture bonds, due April 1, 1916	10,800.00	
Sinking fund of 4 per cent on income debenture bonds outstanding	10,800.00	
Sinking fund of 2 per cent on 6 per cent first preferred stock	75,164.00	
	$634,324.50	
Reserve for bonus distributions	70,674.38	
Miscellaneous	22,665.05	
		727,663.93
Balance, December 31, 1915, as per balance sheet		$2,126,738.99

THE ANNUAL MEETING OF THE FISK RUBBER CO.

At the annual meeting of the Fisk Rubber Co., Chicopee Falls, Massachusetts, held February 16, lack of time prevented action being taken on the proposition to increase the capital stock of the company by $10,000,000, consisting of $5,000,000 in second preferred stock and $5,000,000 common stock. This matter will probably be taken up at the meeting to be held on March 8.

The regular quarterly dividends of 1¾ per cent. on preferred stock, payable May 1, and on second preferred stock, payable June 15, were declared.

H. G. Fisk was re-elected treasurer and clerk, the re-elections to the board of directors being as follows: Stedman Buttrick, E. H. Broadwell, J. C. Cole, H. T. Dunn, H. G. Fisk, Fred T. Ley and G. A. Ludington. At the directors' meeting the following officers were elected: H. T. Dunn, president; E. H. Broadwell, G. A. Ludington and John Kearns, vice-presidents; R. B. McGaw, secretary and assistant treasurer; E. M. Bogardus, comptroller. J. D. Anderson, E. H. Broadwell, H. T. Dunn, H. G. Fisk and G. A. Ludington compose the executive committee. The appointment of J. D. Anderson as sales manager was confirmed.

HABIRSHAW WIRE & CABLE CO. AND ELECTRIC CABLE CO. MERGED.

The Habirshaw Wire & Cable Co., Yonkers, New York, and the Electric Cable Co., Bridgeport, Connecticut, have merged their financial interests in the new corporation known as the Habirshaw Electric Cable Co. The officers of the new company are: Edwin W. Moore, president; R. S. Satterlee, vice-president; J. Nelson Shreve, treasurer, and G. N. Waterbury, secretary.

Both plants will remain under the same management, but the operating forces will be increased, and extensive plant improvements made to meet the rapidly growing demands for the Habirshaw products.

The machinery of the Waterbury Co., Brooklyn, New York, has been purchased, and will be installed in the Yonkers plant. Here the large underground, high and low tension wire and submarine cables will be made, while the small size insulated wire will be made at Bridgeport, Connecticut.

The general offices of the company are at 10 East Forty-third street, New York City. James B. Olson has been appointed general sales manager. The Habirshaw company was founded 28 years ago by Dr. W. M. Habirshaw, and is one of the oldest concerns in America engaged in the manufacture of rubber-covered wire.

ANNUAL MEETING OF THE PENNSYLVANIA RUBBER CO.

At the annual meeting of the Pennsylvania Rubber Co., Jeannette, Pennsylvania, held on February 23, the following officers were elected: Chairman of board, Herbert Du Puy; president and treasurer, H. W. Du Puy; vice-president, C. M. Du Puy; general manager, Seneca G. Lewis; secretary, George W. Shively; assistant treasurer, C. G. Morrill; directors, Herbert Du Puy, H. W. Du Puy, C. M. Du Puy, Seneca G. Lewis and George W. Shively.

The company's report for the season of 1915 shows approximately a four million dollar volume of business, with earnings the most satisfactory in the history of the company. The already heavy demand experienced for their new product, the "Ebony Tread" tire, necessitates increase in building and heating capacity, and this new business, together with the already heavy fixed demand for vacuum cup tires, necessitates preparation for the production of not less than 2,000 casings daily.

BOILER EXPLOSION IN HOWE RUBBER PLANT.

The Howe Rubber Co., New Brunswick, New Jersey, recently suffered a severe disaster in consequence of a boiler explosion in the boiler-house adjoining the main factory building. The cause remains unexplained, the engineer having been killed by the explosion, which wrecked the boiler-house and destroyed the main factory building by fire. One of the mill men was struck with some bricks and died on his way to the hospital, and five others were injured by flying bricks. The new reinforced concrete factory which the company planned to use for the manufacture of tires is almost completed, and additions are now being made to this building to care for tubes also, which will be manufactured by March 1.

THE CONTINENTAL RUBBER WORKS.

The new machine shop of the Continental Rubber Works, Erie, Pennsylvania, is shown as completed in the accompanying illustration. The equipment of the building, which is of steel and

NEW MACHINE SHOP OF CONTINENTAL RUBBER WORKS.

concrete construction, was described in the February issue of THE INDIA RUBBER WORLD.

At the semi-annual meeting of the directors, held on February 7, W. J. Surre, manager of the tire sales department, was elected to the newly created office of second vice-president.

CRIMSON SULPHURET OF ANTIMONY.

American rubber manufacturers should be pleased to learn that in the future they will not have to rely upon a foreign source of crimson sulphuret of antimony. After several years of study and investigation, the Rare Metal Products Co., Glen Ridge, New Jersey, announces that it is making a crimson sulphuret which is in every way equal to the best of European manufacture.

RUBBER COMPANY SHARE QUOTATIONS.

The following market quotations of shares of rubber manufacturing companies on February 25 are furnished by John Burnham & Co., 31 Nassau street, New York City, and 40 South La Salle street, Chicago Illinois:

	Bid.	Asked.
Ajax Rubber Co. (new)	70½	71
Firestone Tire & Rubber Co., common	740	750
Firestone Tire & Rubber Co., preferred	113	..
The B. F. Goodrich Co., common	71	71½
The B. F. Goodrich Co., preferred	113	114
Goodyear Tire & Rubber Co., common	342	347
Goodyear Tire & Rubber Co., preferred	116	117½
Kelly-Springfield Tire Co., common (new)	70	71
Kelly-Springfield Tire Co., first preferred	95	97
Kelly-Springfield Tire Co., second preferred	..	..
Miller Rubber Co., common	225	240
Miller Rubber Co., preferred	113½	116
Portage Rubber Co., common	68	71
Portage Rubber Co., preferred	106	108
Rubber Goods Mfg. Co., preferred	..	..
Swinehart Tire & Rubber Co.	88	89
United States Rubber Co., common	51	51½
United States Rubber Co., preferred	106	108
Fisk Rubber Co., common	110	115
Fisk Rubber Co., first preferred	112	115
Fisk Rubber Co., second preferred	110	..

SECRET RUBBER TRADERS FINED.

Heinrich Bachmann and Mrs. Elsie Schroeder pleaded guilty on February 21 of conspiring to violate the customs laws by attempting to carry rubber from this country as personal baggage without manifests. The defendants, according to the assistant United States attorney, said they were private traders, and Judge A. G. Dayton, in the Federal court, find them $200 each.

INDIANAPOLIS BRANCH OF THERMOID RUBBER CO. REMOVES.

The Thermoid Rubber Co., Trenton, New Jersey, announces that the location of its Indianapolis, Indiana, branch has been changed from 128 East New York street to larger quarters, at 409 North Capitol avenue, where a complete stock of mechanical rubber and automobile goods will be carried. The mechanical rubber department is in charge of L. T. Kuhl, formerly of the main office.

Warren B. Wheeler and Stillman Shaw, who operated as Wheeler & Shaw, Inc., charged with fraudulent use of the mails some years ago in connection with the promotion of the North American Rubber Co., will soon be brought to trial in Boston, Massachusetts, according to reports. This company, it will be recalled, was capitalized for $5,000,000 to manufacture rubber by chemical means.

The American Coal Products Co., New York City, parent organization of the Barrett Manufacturing Co., has united both concerns under the name of The Barrett Co. The new company will have the same amount of stock as the American Coal Products Co., all outstanding certificates being exchanged share for share.

At the annual meeting and banquet of the American Museum of Safety, held February 3 at the Waldorf-Astoria, New York City, the Anthony N. Brady Memorial Medal was awarded to the Union Traction Co., of Indiana, H. A. Nicholl, general manager.

A NEW AUTOMOBILE BUSINESS ASSOCIATION.

The National Automobile Trade Association has been organized at Chicago, Illinois, as a successor of the Associated Garages of America, to create closer harmony between manufacturer, jobber, dealer and garage owner. The officers are as follows: Robert Bland, Evanston, Illinois, president; Robert A. Wilson, Chicago, Illinois, secretary; F. A. Bean, Detroit, Michigan, treasurer. The board of directors is composed of Jacob Friedman, Dyersville, Iowa; E. T. Jones, Akron, Ohio; Walter B. Taylor, Rockford, Illinois; Carl R. Baught, Indianapolis, Indiana, and L. C. Steers, Detroit, Michigan.

TRADE OPPORTUNITIES FROM CONSULAR REPORTS.

A firm in Colombia desires to represent American manufacturers and exporters of rubber goods. Report No. 20,051.

Representation of American manufacturers of automobile tires is desired by a firm in the Netherlands. Report No. 20,066.

Communication with American importers of African rubber is sought by a man in France. Report No. 20,067.

A Brazilian firm wishes to represent American exporters of rubber goods. Report No. 20,132.

An inquirer in Spain desires to purchase waterproof cloth in wholesale quantities from American manufacturers. Report No. 20,231.

A man in the Netherlands is in the market for a large quantity of automobile tires, complete with tubes. Report No. 20,240.

A correspondent in the Netherlands desires to be placed in touch with American manufacturers of flax hose, with and without rubber lining, for use on fire engines. Report No. 20,242.

TRADE NOTES.

The United States Rubber Co., New York City, has reopened the plant of the Lycoming Rubber Co., Williamsport, Pennsylvania, as an overflow factory for its tennis business.

At a stockholders' meeting on February 1, the Mason Tire & Rubber Co., Kent, Ohio, increased its capital stock from $250,000 to $1,000,000, the increase of $750,000 consisting of $600,000 preferred stock and $150,000 common stock. The company's new plant is now under way and it is expected that it will be completed on or before May 15. The building contract has been let to the Akron Storage & Construction Co., Akron, Ohio, for $49,750.

The Stoddard Rubber Co., Millbury, Massachusetts, is enlarging its plant by an addition of 100 feet to the present building, in which will be installed about $10,000 worth of tire making machinery. The Stoddard Rubber Co., of New York City, which is to maintain branches in Boston, Chicago and St. Louis, will have charge of sales.

The La Crosse Rubber Mills Co., La Crosse, Wisconsin, will erect two brick, steel and concrete additions, for which plans are being drawn by V. L. Page, consulting engineer, Rockford, Illinois. One will be a four-story building, 60 x 200 feet, and the other, two stories, 40 x 120 feet.

The Gutta Percha & Rubber, Limited, Toronto, Canada, is erecting an addition to its factory on West Lodge avenue.

The Dunlop Tire & Rubber Co., Toronto, Canada, is extending its plant.

The Iroquois Rubber Co., Buffalo, New York, a subsidiary of the United States Rubber Co., operating as a branch store, will hereafter be known as the United States Rubber Co., Buffalo branch.

At the recent annual meeting of the Alling Rubber Co., Albany, New York, the capital stock was increased to $150,000, and the following officers elected: N. E. Alling, president; S. N. Blakeslee, vice-president; W. C. Minor, secretary and treasurer, and H. A. Sheldon, assistant secretary and treasurer.

The directors of the Ajax Rubber Co., Trenton, New Jersey, have declared a quarterly dividend of 2½ per cent. This dividend is payable March 15, 1916, to stockholders of record February 28.

At its recently held annual meeting the Cincinnati Rubber Manufacturing Co., Cincinnati, Ohio, re-elected last year's officers. The company is erecting new buildings for the accommodation of added lines.

The Schaefer Rubber Co., Cincinnati, Ohio, devised a clever Washington's Birthday souvenir in the form of a rubber hatchet combined with artificial cherries boxed and offered as a memorial to the "Father of his Country."

S. Birkenstein & Sons, 409 West Ontario street, Chicago, Illinois, operators in waste rubber, have recently opened a branch office and warehouse at 134-6 North Front street, Philadelphia, Pennsylvania, with Emil J. Schwab in charge. M. Straus for many years prominently identified with waste rubber interests has become associated with the house of Birkenstein.

The Vulcalose Co., manufacturer of hard rubber substitutes, is now located at 216 West Kinzie street, Chicago, Illinois.

The National Cement & Rubber Co., Toledo, Ohio, will remove to Cincinnati, Ohio, in May.

The Panama Rubber & Equipment Co., St. Louis, Missouri, has recently extended its facilities by leasing further space in the building it now occupies on Locust street. This company manufactures waterproof garments, both in rubberized and cravenetted materials, and also the "Panama Punctureless Cushion" for automobile tires. The officers are as follows: Carl G. Schwarz, president; G. G. Giese, secretary and treasurer.

A new building is being erected for the Hanover Rubber Co., West Hanover, Massachusetts, which will be used for the trimming, packing, inspecting, stock and shipping departments. Upon completion of this addition, the company expects to have a daily output of from 12,000 to 15,000 pairs of heels and 1,000 pairs of soles.

At the annual meeting of the stockholders of the Chicago Rubber Clothing Co., Racine, Wisconsin, held January 22, the following directors and officers were elected: David G. Janes, president; George G. Bryant, secretary and general manager; E. V. Laughton, treasurer, and James Murphy, Charles E. Wells and Louis Nelson, directors.

President Birkenstein of the National Association of Waste Material Dealers called a meeting on February 14 at the Sherman House, Chicago, Illinois, for the purpose of organizing the Western division, as agreed upon at the last regular meeting of the Association, held in New York City.

The Chicago Rubber Clothing Co., Racine, Wisconsin, is to erect a building 125x65 feet, to be devoted entirely to proofing for the trade. It is expected that the new addition will be completed about April 1, giving an added output of 30,000 yards a week.

The Pouvailsmith Corporation, Poughkeepsie, New York, mentioned in the January issue of THE INDIA RUBBER WORLD as the purchaser of the Condensite department of the Essex Rubber Co., Trenton, New Jersey, has begun the erection of three buildings which will total 60x340 feet.

The Russian-American Chamber of Commerce, Moscow, Russia, is preparing recommendations on the terms of a proposed Russian-American commercial treaty, and desires information that will assist it in this work.

H. J. Halaburt & Sons, Chicago, Illinois, have removed their offices to the Lytton Building, State street and Jackson boulevard.

The Stamford Rubber Supply Co., Stamford, Connecticut, has increased its capital from $50,000 to $100,000.

At the annual meeting of the H. W. Johns-Manville Co., New York City, L. R. Hoff, W. R. Seigle, T. T. Lyman, H. R. Trainer, Harry Gillett, F. B. Smith, J. E. Meek, H. R. Wardell and J. W. Perry were elected members of the board of directors.

Broomhall's Imperial Combination Code has been added to the list of those authorized for use in foreign cable messages by the British Postmaster-General, although it is not available for use to Argentine Republic, Brazil, Paraguay, Uraguay and the Republic of Honduras.

By a court order obtained by Salvador Madero, a shipment of crude rubber from Mexico to Detroit, Michigan, worth $50,000, has been held up at San Antonio, Texas, awaiting the establishment of rightful ownership.

The General Engineering Co. has opened an office at 323 Second National Bank Building, Akron, Ohio, and is prepared to handle work in rubber and mechanical engineering.

Under the auspices of the United States Rubber Co., New York City, representatives of the various military organizations in the city gave short talks to the employes of the company on February 24 in the Auditorium of the West Side Y. M. C. A. on the value of military training.

Raymond B. Price, vice-president of the company, urged the men to affiliate themselves with some military organization, both from the view of efficiency as well as patriotic duty. Full time, in addition to their regular vacation, would be allowed to those who joined, as has been the policy of the company in the past.

PERSONAL MENTION.

George B. Hodgman, president of the Hodgman Rubber Co., Tuckahoe, New York, is planning a three weeks' trip to Bermuda early in March.

George H. Pickerell, consul-general at Para, Brazil, is in the United States on a three-months' leave of absence. He can be seen in New York City at the United States Customs House, room 409, Department of Commerce and Labor, mornings between 11 and 12.

Charles B. Whittelsey, vice-president and secretary of the Hartford Rubber Works Co., Hartford, Connecticut, was a passenger on one of the New York, New Haven & Hartford Railroad trains wrecked on February 22, near New Haven, Connecticut, but fortunately escaped injury.

Matthew Hawe, for many years treasurer of the Gutta Percha & Rubber Manufacturing Co., New York City, has retired from the company. The board of directors on February 5 elected to the vacancy, George B. Dickerson, formerly vice-president of the New Jersey Car Spring & Rubber Co., Jersey City, New Jersey.

Henry L. Arbogast, chief chemist of the Portage Rubber Co., Akron, Ohio, has resigned to accept a similar position with the Alliance Rubber Co., Alliance, Ohio.

Thomas G. Richards, president of the B. & R. Rubber Co., North Brookfield, Massachusetts, has been elected a member of the local school board. He has previously served on the town's board of selectmen.

C. H. Williams has been made manager of the Chicago branch of the Goodyear Tire & Rubber Co., Akron, Ohio, and J. A. Leatherman has been appointed manager of the Portland, Oregon, branch.

N. L. Jones, of the Peerless Seamless Rubber Co., Richmond, Surrey, England, was in New York early in February, buying machinery.

Charles R. Haynes has been appointed superintendent of the factory of the Goodyear Metallic Rubber Shoe Co., at Naugatuck, Connecticut.

S. P. Woodward, formerly tire sales manager of the New Jersey Car Spring & Rubber Co., Jersey City, New Jersey, has been appointed vice-president and sales manager to succeed C. B. Dickerson, resigned.

F. E. Titus, branch manager of The B. F. Goodrich Co. at Pittsburgh, Pennsylvania, has been appointed general manager of the Buffalo, Rochester and Syracuse branches of that company. Mr. Titus' headquarters will be in Buffalo, where for eight years he served as assistant manager of the Buffalo branch, leaving here a year and a half ago to assume charge of the Pittsburgh organization. The Buffalo territory comprises thirty-one counties in western New York and nine in Pennsylvania, as well as the Province of Ottawa in Canada.

Wilson C. Dold, who for the past five years has been connected in an important capacity with the Kansas City branch of The B. F. Goodrich Co., Akron, Ohio, has been appointed manager of the St. Louis, Missouri, branch.

G. W. Pritchett has been placed in charge of the North and South Carolina territory of the Morse Chain Co., Ithaca, New York, with headquarters at 805 Ashboro street, Greensboro, North Carolina.

A. J. Fox has been made manager of the Toledo, Ohio, branch of The B. F. Goodrich Co., Akron, Ohio, succeeding H. W. L. Kidder, who was promoted to the Cleveland district.

On February 2 Otto Basten was elected a director of the Rutherford Rubber Co., Rutherford, New Jersey.

H. T. Richards, although with The B. F. Goodrich Co., Akron, Ohio, less than a year, has been appointed branch manager at Memphis, Tennessee.

D. LORNE McGIBBON.

D. Lorne McGibbon, who retired last spring from the presidency of the Canadian Consolidated Rubber Co., Limited, Montreal, Canada, is now interested in the formation of a syndicate to exploit Canadian industries.

Starting his career as a salesman, he had risen above the salesman stage in the rubber business and was accumulating a modest little fortune when lung trouble developed. Determined to fight the disease before it was too late, he went to live in a camp at Saranac Lake, in the Adirondack Mountains. Finding life there dull and lonesome, he had a special wire run up from Albany and began to watch the stock market. There was no one around to influence him, no one to divert his attention at critical moments. He played the market as his reason dictated, and won, becoming worth several millions. Also, his lungs were entirely cured in less than a year and he is now in perfect health. The popular term "a good mixer" aptly describes Mr. McGibbon's social qualities, and he possesses countless friends.

THE BUILDINGS OF THE LOEWENTHAL CO.

The new warehouse building of The Loewenthal Co., dealer in scrap rubber, at 23 Heyward street, Brooklyn, New York, is seen in the accompanying illustration. This shows the group of

THE BUILDINGS OF THE LOEWENTHAL CO.

buildings used for the handling of material. With large facilities and with all conveniences for work the company feels that with the office now joined to the warehouse, even better service will be rendered to customers than when the office was located in Manhattan.

ANNUAL MEETING OF RACINE RUBBER CO.

At the annual meeting of stockholders of the Racine Rubber Co., Racine, Wisconsin, on January 25, the following directors were elected to serve for the ensuing year: L. B. Patterson, Chicago, Illinois; J. W. Bate, H. L. McClaren, J. Weissembach, L. T. Vance, Stuart Webster and H. C. Severance, all of Racine.

A meeting of the newly elected directorate immediately followed, at which H. L. McClaren was elected president and advisory manager; Stuart Webster vice-president, general manager and treasurer, and H. C. Severance secretary and general sales manager.

The Kansas City Tire & Rubber Corporation, Kansas City, Missouri, which recently acquired the property, plant and business of the Chester Rubber Tire & Tube Co., Chester, West Virginia, announces it will continue the operation of the Chester plant in conjunction with the rubber tire factory now being built and equipped in Kansas City, where the general offices of the corporation are located. W. W. Wuchter, as factory manager, will have charge of all manufacturing departments and Philip Freshwater, former general manager of the Chester company, becomes assistant general manager.

On February 15 an involuntary petition in bankruptcy was filed against the American Tire Co., Saugus, Massachusetts, assignment being made for the benefit of creditors to Arthur P. French.

NEW INCORPORATIONS, WITH AUTHORIZED CAPITAL, ETC., 1915.

Alliance Tire Co., Inc., February 9 (New York), $5,000. David and Samuel W. Wallach—both of 903 Prospect avenue, and Henry W. Blumberg, 1574 Madison avenue—both in New York City. Auto tires, etc.

Aluminum Rubber & Tire Co., February 14 (Delaware), $1,000,000. F. L. Buehler, K. M. Dougherty and L. S. Dorsey—all of Wilmington, Delaware. Office, 927 Market street, Wilmington, Delaware. To manufacture rubber tires, tubes, heels, shoes and all other kinds of rubber goods.

American Rubber & Tire Co., The, January 22 (Ohio), $500,000. L. P. Mauger, G. W. Kratsch, F. H. Snyder and Frank Snyder.

Armor Tread Co., Inc., The, February 23 (New York), $35,000. John A. Thomas and Jacob W. Holler—both of Fort Edward, and O. S. Humphrey, 159 Bainbridge street, Rochester—both in New York. To manufacture armor treads for auto tires, etc.

Associated Rubber Co., The, January 22 (Ohio), $150,000. Frank J. Dunklee, Albert D. Wismar, Charles N. Olds and Lawrence J. Johnson.

Automobile Raincoat Co., Inc., February 18 (New York), $15,000. Isidor I. Zeeman, 400 Manhattan avenue, and Arthur Zittel, 1462 Fifty-third street, both in New York City, and Julius M. Zittel, 1427 Fifty-second street, Brooklyn, New York. To manufacture rubber automobile apparel.

Century Tire Agency of New York, Inc., January 29 (New York), $600. John Burlinson (president), 700 West One Hundred and Seventy-ninth street; Mortimer P. Arnold (vice-president and secretary), 415 Madison avenue—both in New York City, and John Stuart Eakin (treasurer), Englewood, New Jersey. Office, 15 East Fortieth street, New York City. To represent the Rubber Insulated Metals Corporation of Plainfield, New Jersey, in the sale of its pneumatic automobile tires and tubes in the metropolitan district.

Continental Rubber Co., January 21 (Ohio), $500,000. G. W. Doerzbach, S. Frohman, J. Dauch, J. T. Sloat and C. E. Sprague. To manufacture automobile tires.

Cosmic Rubber Manufacturing Co., February 4 (Massachusetts), $10,000. Frederick S. and Elizabeth M. Bryant, and Arthur White—all in Reading, Massachusetts. Office, Reading, Massachusetts. To manufacture and deal in tires, accessories and all kinds of rubber goods.

Dunbar Co., Inc., E. J., February 9 (New York), $100,000. Etta Mayer, 914 Union avenue, Bronx, New York City; Herman Mendes, 460 Linwood street, and Harry E. Kaplan, 238 Christopher avenue—both in Brooklyn, New York. To manufacture rubber goods of all kinds.

Eureka Cement Co., The, January 27 (New Jersey), $125,000. James A. Law, 1158 Broad street, and Ross G. Marley, 241 North Eleventh street—both in Newark, and William F. Law, Maplewood—both in New Jersey. Office, 6 Avenue A, Newark, New Jersey. Rubber cement and other goods.

Eureka Rubber Manufacturing Co., Inc., February 16 (New York), $30,000. Rose Goodman, 264 North Sixth street; Harris Hyman, 366 South Fifth street, and Sal Benjamin, 6622 Nineteenth avenue—all in Brooklyn, New York. To manufacture rubberized goods.

Gordon Webbing Co., Inc., February 21 (New York), $15,000. Milton Gordon, 700 West One Hundred and Eightieth street; Irving and Alexander S. Gordon—both of 75 East One Hundred and Twenty-first street—both in New York City. Elastic webbing.

Hill Insulating & Manufacturing Corporation, February 24 (New York), $25,000. Robert R. Hill, 302 Convent avenue, Abbott Leach, 124 West One Hundred and Twenty-third street, and Charles G. Vogel, 2040 Seventh avenue—all in New York City. To manufacture accessories, auto parts, insulation, etc.

Kenton Shoe Repairing & Auto Tire Vulcanizing Co., Inc., February 18 (New York), $3,000. Frank R. Kenton, 849 Jefferson avenue; William J. Grange, 666 Decatur street, and John M. Wiswall, 515 McDonough street—all in Brooklyn, New York.

Lion Tire & Rubber Corporation, The, February (Indiana), $150,000. Ferdinand Dryfus, Thomas Follen, William A. Klepper, Patrick F. Freel, Russell K. Bedgood, Harry J. Haarheyer, George B. Smith, John T. Cullen, Edward Taylor and Thomas Crane. To manufacture tires, casings and tubes.

Mineralized Rubber Manufacturing Corporation, February 7 (New York), $100,000. Theodore E. Larson, 227 Bowne street, City Island, New York; Samuel C. Worthern, 14 Davis avenue, East Orange, and Henry T. Randall, 26 Woodland Road, Maplewood—both in New Jersey. To manufacture articles from rubber, bakelite, condensite and other substances.

Monarch Tire Co., Inc., February 24 (New York), $1,000. Fred and William Rothschild—both of 3569 Broadway, New York City, and Joseph Siskins, 971 Westchester avenue, Bronx, New York City. To manufacture tires, tubes, etc.

Muehlstein & Co., Limited, H., January 20 (Canada), $10,000. Francis Ethelbert McKenna, Joseph Arthur Perodeau, Paul Servillian Conroy, John Mulcair and Henri Baby—all of Montreal, Quebec. Office, Montreal, Quebec. To deal in scrap rubber.

Norka Rubber Co., January 19 (Ohio), $20,000. J. J. Dildine, W. C. Washburn, H. W. Heckman, C. E. Toutts and W. Dildine. Office, 47 Central Office building, Akron, Ohio. To manufacture a patent inner tube for tires.

Northwestern Tire Co., The, January 25 (Ohio), $10,000. Carl and E. K. Lemster, C. E. and Otto L. Hankison.

Perfection Tire & Motor Co., Limited, The, (Canada), $1,500,000. J. H. Christian (president), Fort Madison, Iowa; R. J. Evans (vice-president), Wabash, Indiana; L. A. Rockwell (secretary), and E. A. Stickelman (treasurer)—both of Chicago, Illinois. To manufacture automobile tires, etc.

Sterns Tire & Tube Co., The, January 26 (Delaware), $500,000. Olin and H. E. Bryan—both of Philadelphia, Pennsylvania, and H. B. France, Wilmington, Delaware. Office, 804 Orange street, Wilmington, Delaware. To manufacture and trade in tires and tubes for automobiles, etc.

Travellers Tire & Rubber Co., January 26 (Delaware), $500,000. E. P. Dickinson, T. L. Jennings and E. Penuel—all of Philadelphia, Pennsylvania. Office, Bankers' Trust Co., Ford building, Wilmington, Delaware. To purchase, manufacture or otherwise deal in rubber in its raw state.

Union Packing & Rubber Co., Inc., February 15 (New York), $2,000. Samuel Netwitter, Frank H. Hallefas and Wm. C. Weiss—all of 38 Park Row, New York City. Engine packing materials.

Warwick Rubber Manufacturing Co., January 13 (Ohio), $20,000. L. Y. Croft, Amos Engleback and J. H. Adams. To reclaim rubber.

The record time for transmitting a message by wireless from the Akron, Ohio, office of the Goodyear Tire & Rubber Co. to its Detroit, Michigan, office and receiving the answer, is four minutes.

The large demand for white footwear will greatly increase the usual sale of white cemented sole tennis shoes for the summer season.

OTIS R. COOK.

OTIS R. COOK, general sales manager of the Kelly-Springfield Tire Co., New York City, who has his offices at Cleveland, Ohio, when a mere lad, back in 1893, started to learn the rubber business. He was first employed by The B. F. Goodrich Co. When H. E. Raymond became sales manager of that concern, he took young Cook out of the office, believing that he possessed qualities that would win success on the road as a bicycle tire salesman. His success was marked and finally earned for him the position of general representative of the company.

OTIS R. COOK.

In 1906 Mr. Cook became connected with the Firestone Tire & Rubber Co. as special representative. Two years later he accepted a position with the Federal Rubber Co., Milwaukee, Wisconsin, where he remained until 1910. He then was made general representative of the Kelly-Springfield Tire Co., and in one week he is said to have sold more tires than the company had manufactured during the whole period during which it had made pneumatics.

In 1912 Mr. Cook decided to open a branch in Cleveland, of which he took personal charge. This venture was looked upon with doubt by some officers of the company, but two years later the report is that the business of this office reached the million dollar mark.

In recognition of his valued services, he was then advanced to the position of general sales manager, and in March, 1915, he was made a director of the company. Besides being a salesman of unusual ability, Mr. Cook is a natural leader who inspires the confidence of all with whom he comes in contact. His resourcefulness and ability are shown by the splendid sales organization that he has built up.

MID-CONTINENT CO. ENLARGES DIRECTORATE.

The directorate of the Mid-Continent Tire Manufacturing Co., Wichita, Kansas, has recently been enlarged from five to seven members. A. O. Rorabaugh, a prominent merchant of Wichita, was elected to fill the vacancy caused by the resignation of R. E. Price, former director and general manager of the company. L. H. Powell, president of the Board of Trade, and Henry Lassen, President of the Kansas Milling Co., were elected to the board as additional members. The other directors are: Ransom Stephens, C. D. Darrigrand, C. A. Matson and W. T. Watson.

BRAENDER RUBBER & TIRE CO. OPENS TWO BRANCHES.

The Braender Rubber & Tire Co., Rutherford, New Jersey, has established two new branches. One is located at 1327 Race street, Philadelphia, Pennsylvania, and is under the management of W. L. Porter. The other at 1350-1354 South Michigan avenue, Chicago, Illinois, is under the management of W. J. Heathcock, formerly of the New York branch.

TRADE NOTES.

The Firestone Tire & Rubber Co., Akron, Ohio, held a convention at Columbus, Ohio, on February 17 for the Columbus district, at which 275 dealers and representatives were present. At the banquet, President H. S. Firestone was among the speakers, and E. W. BeSaw, district manager of the Columbus territory, acted as toastmaster.

The Dryden Rubber Co. has purchased property adjoining its present plant at Twelfth street and Kildare avenue and will erect an automobile tire and inner tube factory in the spring.

At a special meeting of the stockholders of The Savage Tire Co., San Diego, California, held January 27, the capital stock of the company was increased from $1,000,000 to $5,000,000. Arrangements were also perfected at this meeting for extended additions to the factory buildings and equipment which will allow for a material increase in output.

The Michelin Tire Co., Milltown, New Jersey, is adding about 30,000 square feet of floor space to its plant.

The name of the Cleveland-Ford Tire Co., Ashtabula, Ohio, has been changed to the Pearce Tire & Rubber Co. This change was thought advisable owing to the fact that the name "Ford" created the impression that only Ford sizes would be manufactured, whereas it is the intention of the company to manufacture all standard sizes of tires.

The authorized capital stock of the Worcester Tire Fabric Co., Worcester, Massachusetts, has been increased from $50,000 to $100,000; $36,000 of this increase to be issued and paid for in cash in full.

The Samuel Cupples Wooden Ware Co., St. Louis, Missouri, is going into the manufacture of inner tubes and casings for automobile tires.

The offices of the Favary Tire & Cushion Co., New York City, have been removed from Fifth avenue and Fifty-seventh street to 30 East Forty-second street.

The Hardman Tire & Rubber Co., Belleville, New Jersey, announces the opening of a new tire store at 2728 South Michigan Boulevard, Chicago, Illinois, under the management of J. W. Culver, formerly district manager at St. Louis, Missouri, for the Boston Woven Hose & Rubber Co., Cambridge, Massachusetts.

The Baltimore Sewed Tire Co., recently formed in Baltimore, Maryland, has purchased the tire equipment of the Service Tire & Rubber Corporation of that city. It will enter into the manufacture of tires in a three-story building, which is being prepared for that purpose. T. James Curtin, an Akron, Ohio, man will take charge of the plant.

The Syracuse, New York, branch of the Firestone Tire & Rubber Co., Akron, Ohio, has removed to the spacious new building the company has purchased at the corner of Genessee and State streets. S. E. Douglass continues as manager of the Syracuse branch.

A plant is being erected at Wakefield, Massachusetts, by Thomas E. Dwyer, licensed representative for the Motor Tire Re-Construction Co., New York City, for the establishment of the reconstruction tire business. It will be equipped with modern machinery, sufficient to care for 200 to 250 tires a day.

The Akron Repair & Tire Co., Toledo, Ohio, recently increased its capital to $5,000 and elected new officers. P. J. Hooper, former manager, is now president; S. D. Brewster, vice-president; Raymond Gates, secretary, and William C. Braatz, treasurer. These men, together with Emil J. Ernst, form the board of directors. The company, which is the exclusive agent and distributor of Swinehart tires for northwestern Ohio, maintains a complete vulcanizing plant for repairs.

R. B. TRACY.

The subject of this sketch, R. B. Tracy, has recently been appointed factory representative of the Michelin Tire Co., Milltown, New Jersey. Mr. Tracy's connection with the rubber industry dates from the time he became connected with the Pope Manufacturing Co., Hartford, Connecticut. Eight years ago he joined the forces of the Michelin Tire Co., starting as manager of its Cleveland, Ohio, branch. Four years later he was favored with promotion to the management of the Chicago branch, which included supervision over the Minneapolis, St. Louis, Des Moines, Cleveland and Kansas City branches. Last October his industry and ability were rewarded by his appointment as factory representative. Now all branches west of Philadelphia come under his direction. Mr. Tracy is widely known in both the east and west, and possesses many friends.

R. B. TRACY.

LOUIS H. PERLMAN WINS RIM PATENT SUIT.

Judge Lacombe in the United States Circuit Court of Appeals, New York City, on February 15 rendered a decision affirming the findings of Judge Hunt in the United States District Court, who held that the Louis H. Perlman's demountable rim patent (United States patent No. 1,052,270) was valid and infringed by the Standard Welding Co., Cleveland, Ohio.

This is considered one of the most important patent decisions affecting automobiles, as it is estimated that 700,000 of the 1,200,000 automobiles to be constructed this year will use demountable rims. Mr. Perlman has stated that it is not his intention to embarrass private automobile owners and that he will require a moderate royalty from manufacturers of rims.

The Jennings-Sullivan Rubber Co., East St. Louis, Illinois, has become local distributor for the Acme "Red Letter" tires, manufactured by the Acme Rubber Manufacturing Co., Trenton, New Jersey.

PERSONAL MENTION.

E. St. J. Clark, well known in England and Australia in the development of Dunlop tires, was in New York City last month.

F. W. Sherwood, formerly manager of the solid tire department of the Firestone Tire & Rubber Co.'s New York branch, has been appointed New York manager for the Gibney Tire & Rubber Co., Conshohocken, Pennsylvania.

A. C. Galbraith, formerly with the Firestone Tire & Rubber Co., has been appointed district sales representative for the New York State territory of the Knight Tire & Rubber Co., Canton, Ohio, the New York City sales having been placed in charge of Marcus Allen.

E. C. Newcomb has taken the agency for Dayton pneumatic tires, made by the Dayton Rubber Manufacturing Co., Dayton, Ohio, for Boston, Massachusetts, and vicinity. He has organized the Dayton Tire Co. of New England, with quarters at 589 Boylston street, Boston, Massachusetts.

F. Haskell Smith, for several years superintendent of the Federal Rubber Manufacturing Co., Milwaukee, Wisconsin, has accepted the position of superintendent of the Lee Tire & Rubber Corporation, Conshohocken, Pennsylvania.

H. H. Hubbard has been appointed assistant manager of the pneumatic automobile tire department of the United States Tire Co., New York City, for the territory west of the Mississippi river.

THE "GIANT" TIRE TWELVE INCHES WIDE.

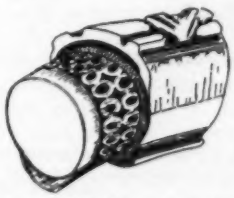
The chief object of this tire is to replace dual equipment for special services, such as on roads with a decided crown, or on unpaved roads.

The "Giant" tire is made in the channel steel hard base pressed-on type in three sectional sizes, 8, 10 and 12-inch. The 8-inch is oversize for dual 4's having about the same volume of rubber as 5-inch duals. The 10-inch is oversize for 5-inch duals; that is, the same volume of rubber as 6-inch duals. The 12-inch is oversize for 6-inch, comparing in rubber volume with the 7-inch.

As originally made, this tire had an extremely high tread. After thorough experimenting, the design was changed and instead of the solid, round section, the present "Giant" has a flat tread, with two circumferential flutes in the 8 and 10-inch sizes and three flutes in the 12-inch. [Firestone Tire & Rubber Co., Akron, Ohio.]

VACUUM CUP SHOCK ABSORBING LINERS.

By the insertion of vacuum cup shock absorbing liners, rim-cut tires that are practically worthless may be used until the carcass is worn threadbare. It is claimed for the vacuum cups that they eliminate at least 85 per cent of the bearing surface, and thus do away with friction, which is always detrimental to the life of a casing.



The vacuum cup liner acts the same as an inner shoe and entirely envelopes the tube. The feather-edge coming between the two beads and channel of the wheel, laps over three rows of vacuum cups. Inflation of the tube automatically locks the liner, which is held in position by the action of the vacuum cups. [F. S. Bryant, Reading, Massachusetts.]

THE "CLINCHER CROSS" TIRE.

The "Clincher Cross" tire shown in the accompanying illustration is claimed to possess unusual non-skidding qualities under all conditions of road, owing to the unique formation of the tread design. On roads rendered dangerous by ice or wet asphalt, this tire is said to possess qualities that render its use safe where steel-studded tires are often dangerous. The increased thickness of the tread offers large wearing surface, reduces liability to puncture and tends to produce high mileage. This tire has seen severe military service upon the continent and the manufacturer claims to possess records showing 15,000 miles on ambulance work without changing the tires. [The North British Rubber Co., Limited, London, England.]

The McGraw Tire & Rubber Co., East Palestine, Ohio, has recently placed on the market a new S. A. E. American type truck tire in addition to its "High Profile" European type tire. A black tread with white side walls will be a distinguishing mark of the McGraw tires this year.

The Gordon Tire & Rubber Co., Canton, Ohio, has appointed A. W. Senz manager of a branch recently opened at the corner of East Ohio and St. Clair streets.

THE RUBBER TRADE IN AKRON.

By Our Regular Correspondent.

AT the annual meeting of the board of directors of The B. F. Goodrich Co., B. G. Work was elected president; A. H. Marks, E. C. Shaw and H. E. Raymond, vice-presidents; C. B. Raymond, secretary, and W. A. Means, treasurer. The offices of second vice-president and general manager have been abolished. W. O. Rutherford, formerly assistant sales manager, was made general sales manager, which position was relinquished by H. E. Raymond, who will, however, continue to exercise active supervision over sales and advertising policies.

Mr. Rutherford has been connected with the company for 17 years. Starting as a salesman, he has served as branch manager at Denver, Detroit and Buffalo. From Buffalo he came to the home office nine or ten years ago as assistant to H. E. Raymond, then general sales manager.

It is estimated that The B. F. Goodrich Co. is spending $25,000 yearly for the protection of the health of its employees, which is twice what the entire city spends for the health of its citizens.

The Goodrich company is making extensive additions which, it is said, when completed, will make its plant the largest rubber factory in the world.

From the surplus at December 31, 1915, the directors voted to set aside $1,700,000 to increase the reserve for contingencies from $300,000 to $2,000,000, together with a sum of $100,000, as an initial amount, for a pension fund. The directors were led to appropriate this amount for contingencies on account of the general unsettled conditions existing throughout the world and the consequent desire to reinforce the fund available to meet unfavorable conditions should they arise.

The following tabulated statement of the year 1915 shows larger net earnings than the advance statement published in the February issue of THE INDIA RUBBER WORLD:

	1915.
Net sales	$55,416,866
Manufacturing, selling and general administration expenses	42,825,908
Net profit from operation	$12,590,957
Miscellaneous income	467,690
Total income	$13,058,648
Depreciation	$734,544
†Reduction of preferred stock	11,878
Interest on bills payable	46,546
Net profit	12,265,679
Preferred dividend	1,960,000
Surplus	*10,305,679
Appropriation for contingencies	1,700,000
Preferred stock redeemed	1,100,000
Pension fund	100,000
Previous surplus	3,177,910
Profit and loss surplus	10,583,589

*Equal to 17.17 per cent earned on $60,000,000 common stock, against 5.62 per cent on same stock previous year.

†Reduction of treasury preferred stock from cost to par value.

The consolidated balance sheet as of December 31, 1915, compares as follows:

ASSETS.

	1915.
Real estate, buildings, plant, good will, etc	$71,502,099
Inventory of other costs	1,213,477
Preferred stock in treasury	775,700
Société Française B. F. Goodrich	2,121,140
Current assets	31,242,023
Deferred charges	231,793
Total	$107,086,232

LIABILITIES.

Common stock	$60,000,000
Preferred stock	28,000,000
Current liabilities	4,402,642
Reserve for contingencies	2,000,000
Pension reserve	100,000
Surplus	10,583,589
*Appropriation	2,000,000
Total	$107,086,232

*Appropriation from surplus for redemption of preferred stock.

The Goodyear Tire & Rubber Co. has purchased a large tract on Market street, opposite its plant, and will erect a garage, estimated to cost $50,000.

English and citizenship classes are being organized for the benefit of the 1,000 men of alien birth employed at the Goodyear factory. Announcements of the proposed classes have been printed in seven languages and distributed throughout the plant. In the English classes speaking, reading and writing will be taught, and for citizenship the instructor will cover such subjects as history, the fundamental principles of American government, and the geography of our country.

A new organization of general office employees of the Goodyear company has taken over "The Colony," the old F. A. Seiberling residence on Market street, for a community club house. A steward and housekeeper have been installed and the building is newly furnished. Present accommodations limit the membership to 27 men.

C. W. Seiberling, vice-president of the Goodyear Tire & Rubber Co., gave a dinner on January 28 to 165 employees of the company, including foremen and department managers. The meeting is the beginning of a plan to bring employees of the company into closer touch with department heads and foremen, and to interest them in educational movements and hygiene.

* * *

The General Tire & Rubber Co.'s new plant of steel and concrete construction, located in East Akron, is equipped with the latest machinery and devices, and has both water and rail facilities. M. O'Neil, the president, was formerly owner of a local department store and is prominently identified with tire fabric and other interests in Akron. W. O'Neil, the vice-president and general manager, formerly operated the Western Tire & Rubber Co., with which organization W. E. Fouse, the secretary, was also connected. T. T. O'Neil, son of the president, is the manager of publicity. The factory staff is as follows: Charles Jahant, superintendent; Robert Iredell, assistant superintendent, and H. B. Pushee, chemist. The latter was formerly chemist for the Goodyear Tire & Rubber Co.

* * *

An orchestra has been organized among the employees of the Firestone Tire & Rubber Co., with S. W. Dickinson, of the order department, as director.

The swimming pool of white glazed tile for the new Firestone club house will be 61½ feet long, 20 feet wide, 8 feet deep at one end and 4 feet deep at the other.

* * *

The American Tire & Rubber Co. has recently reorganized. The newly elected officers are: F. H. Snyder, president; Charles Dietz, vice-president, and George W. Kratch, secretary and treasurer. The new directors are: Fred H. Snyder, Frank H. Snyder, I. M. Taggart, A. J. Waltz and Louis P. Mauger. The company will make tires, tubes and accessories.

* * *

A Sunday school class for rubber workers has been organized at the Grace Methodist-Episcopal Church in East Akron. It is the first of its kind in the city and is known as the Rubber City Men's Bible Class. Its activities are to be social as well as religious.

* * *

The Akron Double Tread & Tire Co. is planning the construction of a two-story reinforced concrete factory addition, to cost $30,000.

* * *

The Miller Rubber Co. has taken out a permit for a new three-story factory building, to cost $18,000, at Getz street and Cole avenue.

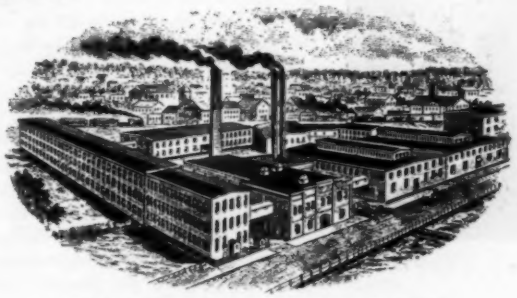
* * *

The Mohawk Rubber Co. has increased its output from 250 to 350 tires per day.

THE RUBBER TRADE IN BOSTON.

By Our Regular Correspondent.

GENERAL PROSPERITY is visiting the various branches of the rubber trade, and the expectations are that he will make a lengthy stay. Mechanicals are having a good call. There is joy for the belting men in the scarcity of leather, and the consequent increased demand for rubber belting. A call for fire hose is always expected soon after town-meeting days in March. Orders for garden hose begin to flow at the same time. Clothing manufacturers already have more business than they can comfortably handle and salesmen now out are sending orders for more. The tire manufacturers are busy right along with orders ahead, and no trouble has been found in securing business at the advanced prices. Druggists' sundries are, at least, normally active.



The Stoughton Rubber Co.'s Factory.

Since the second week in February, New England has had all the snow it cared for, and while the general public may not have been pleased with the snow, thaw and slush, the rubber boot and shoe trade has flourished.

* * *

Occasionally a traffic policeman is run over or crowded between moving vehicles, and some have been severely injured. It is claimed that the dark uniforms they wear, especially the black rubber coats, blend too easily with rain and fog. Some time ago a prominent rubber clothing man endeavored to interest the police officials in the matter of apparelling their crossing officers in white rubber uniforms on rainy and dark days, but no sale was made.

Late in January a mechanical traffic regulator was put on trial at Winter and Tremont streets. This was in charge of its inventor, who, on a rainy day, donned a complete suit of white rubber, a cap with shoulder cape, overcoat with cape, and rubber boots. This man was so much more conspicuous than the police officer stationed near him that the question was at once on the lips of pedestrians, teamsters and motorists, "why shouldn't the police be so dressed?"

Undoubtedly there are arguments in favor of making the "Traffic King" more conspicuous than he is today, encased in a black rubber coat. It would be a good sale for some concern to outfit 130 or 140 policemen with white rubber helmets, coats and boots, but so far, no one has been smart enough to secure such an order.

* * *

The Revere Rubber Co., whose main office and factory are at Chelsea, has leased the second floor in the handsome new business building, 62 High street, where it will move its Boston office. The accounting and sales departments will be located here, and stock will be carried to fill detail orders. This new location is especially appropriate for the business, being situated in a section very largely devoted to machinery and lines to which this company caters.

* * *

The American Rubber Co. exhibited its line of clothing samples to its western jobbing customers at Chicago, Illinois, on February 14, and to its middle states customers at New York City on February 23 and 24. On these dates the orders are taken for samples, and these are combined and put through the factories as one order, and then all shipped simultaneously, so that no favoritism is shown. All the jobbing houses thus receive their samples on approximately the same date.

* * *

Mention was made last month of the consolidation of the American Rubber Co. and the Stoughton Rubber Co., and the removal to new offices and salesrooms early this month. This combined concern is the largest manufacturer of rubber and rainproof clothing in the world. The first-mentioned company manufactures 3,000 garments per day, and the latter 1,200. It is the intention of the new management to increase this by about 20 per cent. in the near future.

The American Rubber Co.'s Factory.

This merger will remove from the trade lists the time-honored name of the Stoughton Rubber Co., though only in name will the change be noted. All its specialties will be made as heretofore, and its customers served as they have been in the past. The history of the Stoughton Rubber Co. is interesting. It began in 1877 as the Mystic Rubber Co., with a capital of $13,000. Ira F. Burnham, who at the time of its organization became one of its two traveling salesmen, was made superintendent and manager in 1881. This company was the second to manufacture rubber gossamer garments, the cloth being coated in Stoughton and the garments made up in Boston. In 1883 the manufacture of calendered clothing was begun and much machinery was added.

In February, 1889, the Stoughton Rubber Co. was organized, with a capital of $100,000, to succeed the Mystic Rubber Co. In April of the same year the capital was increased to $200,000, and the company took over the assets and good-will of the Hall Rubber Co., of Watertown, Massachusetts. New buildings were added, and the stitching department removed to Stoughton, where this company was the first to discard foot-power sewing machines for steam power in the manufacture of rubber clothing. In 1893 the company started the manufacture of mackintosh clothing, and two years later a line of cravenette rain garments was added. Mr. Burnham became president and general manager in 1903. Since then the history has been one of steady progress. Large additions to the plant have been frequent, tenement houses for its workmen have been built, and the works now employ between 300 and 400 hands.

The history of the American Rubber Co., of East Cambridge, is too well known to need telling here. This immense plant is devoted to the manufacture of footwear and clothing. The latter department has been under the sales management of N. Lincoln Greene, who is well known throughout the entire trade. In the new organization, in which both Messrs. Burnham and Greene are vice-presidents, Mr. Greene will be manager of the clothing department, while Mr. Burnham will have general oversight of manufacturing. Mr. Greene will have as assistant manager of the clothing department Ellsworth H. Hicks, who was vice-president and principal salesman of the Stoughton Rubber

Co. Lester Leland remains president of the company, Homer E. Sawyer general manager, H. H. Nance treasurer and E. F. Dewing clerk. The remaining directors are A. L. Comstock and H. E. Converse.

* * *

The Converse Rubber Shoe Co. has let the contract to enlarge its present factory building, making its width 90 feet, instead of 60 feet. There will also be built a four-story, reinforced concrete addition 150 feet long, 68 feet wide. The present storehouse on the west side of the Boston & Maine Railroad track will be used exclusively for the increasing tire business of the company. A new four-story storehouse 200 feet long is now being erected. This will give the company much needed storage room. The capacity of its footwear department will be increased from the present output of 8,000 pairs to a daily capacity of 15,000 pairs.

The stockholders recently voted to increase the capital stock from $700,000 to $950,000 by selling 2,500 shares of non-redeemable, 7 per cent. cumulative preferred stock.

* * *

The Boston Woven Hose & Rubber Co. will advertise its business by a series of moving picture films, showing all the processes pertaining to the various lines of goods it makes. The photographs are being taken under the direction of Mr. Conder, who is preparing a lecture to accompany them. When the factory films are added to those illustrating the various stages of gathering, smoking and shipping the crude rubber, every step will be shown from the trees in the forests of South America or on the plantations of the Far East, to the perfected goods as made in the rubber factory in Cambridge. Such an illustrated lecture will be instructive as well as entertaining, and at the same time should prove a practical advertisement.

* * *

Artistic window cards and posters announce the Automobile Show, which will be held at Mechanics' Building beginning Saturday evening, March 4, and lasting through the following week. From present indications this will be far more elaborate than any previous show.

* * *

Among the members of the trade who have been fleeing from the frozen north to summer climes, we might mention E. H. Clapp, who, at last accounts, was playing golf at Bellair, Florida.

Francis H. Appleton is at Miami Beach, Florida. Friends are expecting him to send north a few dozen tarpon.

* * *

W. H. Porter, manager of the United States Rubber Co., of New England; D. E. Gray, manager of the Beacon Falls Rubber Shoe Co., and Horace G. Cressenger, manager of the Arco Rubber Co., were special guests at the meeting of the New England Shoe Wholesalers' Association held February 2 at Young's Hotel.

* * *

The Monatiquot Rubber Works Co., of South Braintree, manufacturers of "Naturized" rubber, has completed additions to its plant, which will increase its output 25 per cent. This factory is running day and night, and it is understood that plans are under way for additional equipment.

THE RUBBER TRADE IN TRENTON.

By Our Regular Correspondent.

THE Rubber Manufacturers' Association of Trenton has been formed in this city and its membership list includes the representatives of every plant in Trenton. The main object of the organization is to promote cooperation between the men of the shops and the heads of the concerns. It is believed the formation of the association will prove mutually beneficial to the employers and employes alike.

At the first meeting the following officers were elected: John A. Lambert, treasurer of the Acme Rubber Manufacturing Co., president; John S. Broughton, president of the United & Globe Rubber Manufacturing Cos., vice-president; Robert J. Stokes, secretary of the Thermoid Rubber Co., secretary; Alfred Whitehead, treasurer of the Whitehead Bros. Rubber Co., treasurer. A constitution and by-laws were adopted and a number of committees will shortly be named to look after the various activities of the association. A permanent meeting place will also be provided shortly. Meetings are to be held monthly.

* * *

John S. Broughton is the new president of the United & Globe Rubber Manufacturing Cos., having been chosen at a recent meeting of the stockholders to succeed the late Watson H. Linburg, whose death was chronicled in the last issue of THE INDIA RUBBER WORLD. Mr. Broughton is one of the best-known rubber men in the country. He has been connected with the trade for the past 25 years, having become associated with the United Rubber Co. before it was consolidated with the Globe company about 15 years ago. H. B. Tobin, a son-in-law of the late Mr. Linburg, has been elected secretary and treasurer of the company.

JOHN S. BROUGHTON.

There will be no change in the policy of the concern, and the same lines as formerly will be manufactured. The ownership of the extensive plant is now vested in the estate of Watson H. Linburg and Mr. Broughton. The company is prospering and found it necessary not long ago to erect a three-story building 200 x 50 feet to take care of increasing business.

* * *

E. B. De Vere, who has been covering the Middle West as a traveling man for the Essex Rubber Co., has been placed in charge of the Chicago, Illinois, office of this firm. No announcement is made as to a successor to Mr. De Vere on the road.

The Essex Rubber Co. is running night and day, turning out orders. The new inner tube department is working at capacity.

* * *

The Royal Rubber Co. will shortly begin manufacturing a line of rubber toys. If the venture is a success the business will be taken up on an extensive scale. Considerable new machinery has already been installed in the plant for this purpose. The company is now making a specialty of ice bags.

* * *

General C. Edward Murray, treasurer of the Empire Rubber & Tire Co. and of the Crescent Insulated Wire Co., was informed that the employes of his plants intended taking up a collection to be given as a "free will offering" to Billy Sunday. He promptly announced that whatever sum the men raised he would double. It is said the men were most generous in their donations. The General had to write a pretty fat check, but he kept his word.

* * *

The late William S. Hancock, who was extensively identified with the rubber trade, was honored at a meeting of the board of Directors of Mercer Hospital, when a bronze memorial tablet was unveiled. Mr. Hancock was a director of the hospital for 20 years and contributed generously toward the support of the institution. By his will, he made the hospital the residuary legatee of his estate.

* * *

At the annual meeting of the Globe Rubber Tire Co., which was held on February 1, the following officers were elected: Horace B. Tobin, president; John S. Broughton and Henry L. Joyce, vice-presidents; Harry B. James, treasurer, and Joseph P. Hall, secretary and assistant treasurer.

THE RUBBER TRADE IN RHODE ISLAND.

By Our Regular Correspondent.

CONTINUED and, if anything, increasing activity is the rule in the rubber industry of this state. All of the manufacturing plants through Rhode Island are being rushed to the limit of present facilities. There is plenty of opportunity for several hundred additional employees, if competent, and more than one concern would immediately increase its factory capacity if desirable help could be obtained. That Rhode Island is not the only place where a shortage of desirable help is being experienced may be gathered from the number of advertisements appearing in the local newspapers calling for experienced rubber workers to take positions in plants in other sections of the country.

* * *

Orders for hundreds of cases of rubber footwear came to hand after the stormy weather in the early part of February, materially accelerating conditions and causing heavy inroads on stocks.

* * *

The 500 employees at the Woonsocket plant of the American Wringer Co. the first of the month received an increase of 5 per cent in wages. The new superintendent, Jesse P. Walsh, is making changes and improvements beneficial to the employees. Mr. Walsh, who was chosen to succeed the late Michael M. Flynn, has been with the company 43 years, 35 of which he has been either foreman or assistant superintendent.

At the annual meeting held a few days ago no change was made in the list of officers, the six former directors being re-elected. The statement for the year ending December 31, 1915, shows gross earnings, $179,597.75; reserve from 1915, $15,000; expenses, $116,676.92; surplus on January 1, 1915, $180,000; dividends paid, $85,125; dividend declared payable January 15, 1916, $28,375; depreciation, $4,420. The surplus on January 1, 1916, is $140,000.

* * *

The Phillips Insulated Wire Co., of Pawtucket, is seeking to have its capital stock increased to $2,500,000. A bill to authorize the issuing of 25,000 shares of common stock with a par value of $100 has been introduced in the Rhode Island legislature, and referred to the Senate committee on corporations. The company was chartered at the May session, 1892, with a capital stock of $100,000. The incorporators were Herbert O. Phillips and Edgar B. Phillips.

* * *

The plant of the National India Rubber Co. at Bristol is being operated almost exclusively to the production of tennis shoes, though large quantities of insulated wire are being shipped for export. The tennis shoe production of this plant during February was far in excess of any previous month in the history of the concern.

Edward E. Bunn, secretary to Vice-President Le Baron C. Colt, of the National India Rubber Co., who was confined to his house at Bristol since the middle of the month by an attack of diphtheria, is slowly convalescing.

* * *

Colonel Samuel P. Colt, president of the United States Rubber Co., is planning numerous improvements and additions to his country estate at Bristol, and has engaged Frank A. Crabb, an engineer from Williamsburg, Ohio, as superintendent. The new barn is practically completed on the exterior, and work is being pushed on the interior of the building, which is to cost approximately $100,000.

Colonel Colt left Providence about the middle of the month in his private car, with a party of friends, for Washington and Palm Beach, Florida. They remained a couple of days at Washington, and will stay at Palm Beach about ten days.

AUTOMOBILE SHOW CALENDAR FOR MARCH.

March 1-7.—Fargo, North Dakota. Auspices, Gate City Automobile Show Corporation, W. M. Bell, manager.

March 4-11.—Boston, Massachusetts. Fourteenth annual show. Mechanics' Hall.

March 8-11.—Davenport, Iowa. Tri-City sixth annual show. Coliseum, G. F. Bermeister, manager.

March 8-11.—Mason City, Iowa. Second annual show. Auspices, Local Automobile Dealers. Armory, W. H. Hathorn, secretary.

March 8-11.—Moline, Illinois. Annual Tri-City show. Promoter, Tri-City Automobile Trade Association.

March 8-11.—Rock Island, Illinois. Annual Tri-City show. Promoter, Tri-City Automobile Trade Association.

March 8-15.—Brooklyn, New York. Annual show. Auspices, Brooklyn Motor Vehicle Dealers' Association.

March 13-18.—Reading, Pennsylvania. Berkshire Hotel.

March 15-18.—Trenton, New Jersey. Armory, J. L. Brock, manager.

March 21-25.—Deadwood, South Dakota. Auditorium. Auspices, Deadwood Businessmen's Club, G. K. Kilter, manager.

March 28-April 3.—Manchester, New Hampshire. Auspices, Couture Brothers' Academy.

INFLAMMABILITY OF GASOLENE VAPOR WITH AIR.

Interesting data on the inflammable limits of mixtures of gasolene vapor and air, together with the method of determining the gasolene content in such vapor are given in Technical Paper 115, recently issued by the Department of Interior, Bureau of Mines, Washington, D. C.

The tests for the range of explosion were made in a Hempel explosion pipette. Combustion was deemed complete when upon the ignition of the mixture, flame filled the vessel as far as could be judged by the eye. Measuring the percentage of gasolene vapor in the mixture it was found that no visible results were obtained until somewhere between 1.9 and 2 per cent. gasolene vapor. At 2 per cent. there was complete inflammation. Experiments showed that complete inflammation resulted up to as high as 6 per cent., after which only incomplete inflammation resulted.

Another set of experiments brought the figure at the lower limit down to 1.5 per cent. gasolene vapor. This was for gasolene of 73 degrees Baume. A new set of experiments was made to determine if the low limit for 73-degree gasolene was different from that of what is known as cleaners' naphtha which has a Baume rating of 59 or 60 degrees. It was found that complete inflammation started between 1.4 and 1.5 per cent. gasolene vapor. Roughly, it may be stated therefore, that a mixture is explosive between the ranges of 1.4 and 6.4 per cent. gasolene vapor as far as complete combustion is concerned.

SIX USES FOR AN OLD RAINCOAT.

Wearing apparel discarded by the original owner as unsuitable for further service is often made over for the use of another, but seldom is any garment capable of conversion into quite so many articles of utility as those suggested for the worn-out raincoat. These suggestions, which were evidently compiled by some housewife become adept by long experience in the art of "making ends meet," are as follows: First, rip the raincoat apart and wash it thoroughly, after which it may be turned into: A large apron for household use—when scrubbing or washing; a chemistry apron for the daughter in high school; a dusting cap and sleeve protectors; cases for sponges, brushes and toilet articles; a cover to tie over the laundry basket, and a lining for the laundry basket when the soiled linen is sent to the "wet wash." Thus, whenever father and the boys come out in new up-to-date raincoats, mother and the girls may indulge in comfort and protection limited only by their ingenuity and the sizes of the discarded garments.

The Rubber Trade in Germany.

By Our Regular Correspondent.

SINCE our country settled down to war conditions commercial and industrial progress has been regular and from month to month conditions have slowly but steadily improved. With the exception of the building trade and the textile industries all has been moving on as smoothly and as satisfactorily as could be expected considering the many difficulties incidental to war. Our rubber industry is in some instances more busy, in others less occupied than it would be at this season in normal years. Most tire factories are well provided with orders and the cable and insulated wire industry is doing well.

The readers of THE INDIA RUBBER WORLD will no doubt be interested in the following brief review of the past year.

REVIEW OF THE YEAR.

In spite of the war which had been progressing for five months, the year 1915 began under conditions that were not unpromising to our commercial and industrial life.

The available supplies of both crude and manufactured materials were surveyed, and in some instances, were taken over by the government or by organizations created by our rulers, and their distribution was made to the best of all interests. While our armies were fighting, the inventive, resourceful German minds were working and creating serviceable substitutes for materials and goods that threatened to be scarce.

Trade was throughout the year confined to the domestic markets and to the neutral countries; Sweden, Norway, Denmark, Holland and Switzerland. Towards the end of the year, however, Great Britain began to exercise so close a control over the trade of these countries that they stopped sending us raw materials and we were obliged to curtail our sales to them.

THE RUBBER SITUATION.

The rubber manufacturers who had orders for the army and navy, were very busy at the beginning of the year, while the others had very little to do, chiefly on account of the high cost of raw materials and the scarcity of skilled labor.

Manufacturers, who had finished goods in stock, did a good business, because the public realized the situation and purchased heavily, providing for the future. Payments were generally satisfactory although long credits were frequently looked for.

The heavy purchases and the measures taken by the government to preserve sufficient crude rubber for the needs of the army and navy forced rubber manufacturers early in 1915 to begin extensive manufacturing of substitute or "war qualities" and many rubber factories abandoned most of their rubber goods to take up the manufacture of other lines of merchandise. Such changes were not unaccompanied with great difficulties, as will be readily realized by practical rubber men.

No novelties in rubber goods appeared during the year, but their absence was more than made up for by the almost complete lines of substitute goods provided by our manufacturers who justly consider these "war qualities" as the greatest achievement of the German rubber industry. Our people have learned that they can do without imported rubber goods and our manufacturers believe that in the future they will have a far greater share of the home business than formerly. The war has, further, done away with many evil practices in systems of delivery and payments that had grown into our rubber trade and which we trust will not appear again in the future.

TIRES.

The enormous consumption of solid and pneumatic tires by our army has given our manufacturers all they could handle in this line. Towards the end of the year, however, army orders were mostly completed and factories became less busy. The cycle tire industry, however, was not favored by war conditions. Only reclaimed rubber was available for making casings and only very limited quantities of crude rubber were allowed for inner tubes. Then came the restrictions on the use of cotton fabrics which practically stopped the manufacture of cycle tires for other than military purposes.

RUBBER TOYS AND DRUGGISTS' SUNDRIES.

There was practically no call for rubber sporting goods, toys, articles of luxury and the like and had a demand existed the lack of the necessary raw materials would have greatly curtailed manufacturing even in substitute qualities. As an instance of the effect of the crude rubber shortage, nipples, which prior to the war were being made of transparent stock, have reverted to the old-fashioned red and black qualities.

Business throughout the year was very slack in sanitary and surgical rubber goods, because the essential, fine crude rubber could only be had for military purposes and skilled labor, which is very important in this line, was really scarce.

MECHANICAL GOODS.

Some manufacturers of mechanical rubber goods report good business, while others are dissatisfied. As few new machines were installed, and most old machines worked far less than in normal times, there naturally was no great demand for rubber mechanical goods. Their sale was further reduced by the stagnancy that prevailed in the building trades. During the summer much was expected of increased agricultural activity and from the extensive use of machinery in this line but this field did not prove to be sufficient to offset the lack of business in other lines.

RECAPITULATION.

In spite of the lack of crude rubber, of the shortage of skilled labor, the lack of naphtha, alcohol, sulphur and other accessory materials, in spite of the increased cost of coal and of lighting material, not to mention the curtailed home trade and the almost total interruption of foreign intercourse, our rubber industry is still healthy and full of life. It has learned the value of substitutes and will use its knowledge in the future if any one attempts to withold crude rubber supplies.

TRADE NOTES.

The Verband Deutscher Gummiwebwaren-Industrieller, G. m. b. H. was recently organized at Barmen with 20,000 marks [$4,760] capital, to promote the commercial interests of German manufacturers of textiles for the rubber industry.

Gollert-Reifen, G. m. b. H., is the name of a new 50,000 mark [$11,900] corporation recently formed in Berlin to manufacture and deal in automobile tires in general and the Gollert patent tire in particular.

The Vereinigte Dürener Treibriemenfabriken G. m. b. H. at Düren has been incorporated with a stock capital of 60,000 marks [$14,280] to manufacture transmission belts, waterproof covers and tents.

At a recent joint meeting of the leading organizations of manufacturers and dealers in cycles and motor vehicles, a resolution was passed emphasizing to dealers the importance of economy and advising them to exercise a maximum of care in repairing worn tires, to be cautious to discard none unless absolutely beyond repair and informing them that they should not stock too much rubber solution because the present qualities dry up fast even when sealed in tubes and should therefore be sold rapidly. The attention of dealers was also drawn to the necessity of holding old and worn tire valves which they are permitted to sell only in lots and after obtaining permission. A petition to the

Imperial Chancellor was prepared asking that he permit the release for private use of sufficient quantities of rubber solution and rubber sheet to make inner tubes.

The Erste Deutsche Special Hartgummifabrik G. m. b. H. was recently incorporated at Königstein with 30,000 marks [$7,140] stock capital, for manufacturing hard rubber goods.

Imhof, Bocholtz & Vogeler, Barmen, manufacturers of rubber bands, presented their employes with a week's pay on the day before Christmas. Wives of workmen now in the field received a money present amounting to more than one week's salary, and the men at the front were also remembered.

Dr. William Berghegger and Paul Jander have been made substitute directors of the Reinische Gummi & Celluloid Fabrik, Mannheim, Neckarau.

Arthur Schalkau has been made business manager of the Gummifabrik Westend, Spadau.

PERSONALS.

Professor Dr. Harries, director of the chemical laboratories of the Kiel University and noted for his works on synthetic rubber, has resigned to become a director of Siemens-Schuckert Werke, Berlin.

Georg Oehlschlägel, of the Asbest-und Gummiwaren-Firma Reinhardt Leupolt, Dresden, was recently presented with a diploma of recognition by the Dresden Chamber of Commerce.

AUSTRIA.

The Helsingborgs Gummifabriks A. G. recently held its annual meeting of shareholders in Vienna and declared a 6 per cent dividend.

It is reported from Buda-Pest that, in spite of the cutting off of all imports of crude rubber, the Hungarian Rubber Goods Manufacturing Co. has, by modifications of its methods, been able to produce the most needed rubber articles. An extraordinary meeting of shareholders was held recently, and it was decided to increase the capital stock from 1,500,000 to 6,000,000 crowns [$304,500 to $1,218,000]. A dividend of 16½ per cent. was declared.

THE SITUATION IN RUSSIA.

By a Special Correspondent.

WAR has brought about great changes here in Russia. The impossibility of any extensive exports and the difficulties of domestic transportation, coupled with enormous wheat crops, have resulted in great congestion and in the accumulation of enormous quantities of foodstuffs and other merchandise. In many districts the accumulation of wheat has become so large that it has been found necessary to turn even the churches into granaries, while in other districts famine is rampant, due to a lack of shipping facilities.

Generally speaking, the masses are more prosperous now than in normal times. The mobilization has made labor less plentiful than heretofore and wages all have greatly increased. Unskilled labor that formerly earned less than 50 cents per day is now receiving as high as $3, and the prohibition of the sale of intoxicants prevents the lower classes from turning the bulk of their wages into vodka, as in the past.

The result is clearly shown in the operations of the Government Savings Banks. During the month of November there was an increase in deposits of 47,600,000 rubles [$24,514,000], and the total deposits on December 1, 1915, amounting to 2,384,200,000 rubles [$1,227,863,000]. The increased prosperity is evidenced by greater expenditures for wearing apparel, including greater consumption of rubber footwear. It is now common to see galoshes worn by people who before the war could not afford "rubbers," which here in Russia, even in normal times, cost practically twice what they do in the United States.

EFFECT OF WAR ON RUBBER FACTORIES.

Prior to the war our two largest rubber manufacturing companies, the Russian-American India Rubber Co., "Treügolnik," Petrograd, and the Russian-French India Rubber, Gutta Percha and Telegraph Works, "Prowodnik," Riga, as well as most of our smaller rubber manufacturing concerns were in the hands of Germans. The management was German, and Germans were at the head of the different departments.

When war came all these foreigners had to be eliminated and Russians found to fill the vacancies. This alone amounted to almost total reorganization. After our troops had evacuated Warsaw, the German armies pushed forward into Courland and threatened Riga so that the vast supplies of material, machinery and finished goods of the great Prowodnik works had to be removed to the neighborhood of Moscow. The magnitude of this operation will be realized when it is known that the Prowodnik works employed more than 18,000 hands and required 20,000 horsepower.

The class of labor at the Riga works was what is known here as Baltic labor, composed of Russians, Finns, Hebrews, Scandinavians, Germans and Poles. The war made it necessary to reorganize and new help had to be recruited and instructed. This was successfully accomplished with practically no interruption in manufacturing operations. Prowodnik has materially increased its capital, has practically joined hands with Treügolnik and has opened large offices and salesrooms in Moscow and in Petrograd.

Our leading rubber manufacturing companies are tremendously wealthy and had large quantities of crude rubber and other raw materials on hand when the war broke out. Before Turkey joined in the struggle much raw material was imported by way of the Black Sea, but since the Bosphorous was closed most of our supplies have come via Vladivostok and by way of Archangel. These imports via Vladivostok alone amounted to 112,000 poods [4,044,633 pounds] during the first six months of 1915, so we have experienced no shortage of crude rubber.

Our large rubber factories have been able to maintain their enormous production. During 1914, in spite of war conditions which affected the latter portion of the year, Russia exported $1,196,000 of rubber footwear and $1,466,000 of other rubber goods. We are able to produce both solid and pneumatic tires in quantities sufficient for all our needs: the tires we have been importing are mostly of American measurements for the equipment of the motor vehicles we purchased in quantities from America after the war started.

RUBBER FOOTWEAR REPAIR SHOPS.

The high cost of our rubber footwear and the natural frugality of our people has created in this country a trade unknown in America, the repairing of rubber boots and shoes. In all our cities, towns and villages there are shops where "rubbers" are repaired "while you wait." These shoe menders state that the public now discards "rubbers" which in normal times they would have repaired.

RUBBER STATISTICS.

Statistics for 1914, recently published, show that our imports of crude rubber and gutta percha amounted in value to $14,807,000, of which $6,881,000 were imported from Great Britain, $3,182,000 from Germany, $797,000 from the United States, $560,000 from the Netherlands and $164,000 from France. During the same period our imports of manufactured rubber and gutta percha only amounted to $714,000.

RUBBER SCRAP.

Comparatively speaking, very little rubber scrap is reclaimed here. Our leading companies can handle little more than 200 tons per day. Practically all of the rubber scrap produced is collected for export to England, the United States and Germany. Exports to the United States alone, averaged 6,235,916 pounds in weight and $492,425 in value per annum during the last three normal years previous to the war. This consisted chiefly in

worn-out rubber footwear and thousands of men, women and children found a livelihood in collecting, sorting and packing rubber scrap. Under present conditions this industry is practically dead.

The total exports for 1914 amounted to only $73,000. This state of affairs is due to the lack of transportation, the practical impossibility of export trade due to high freight rates, and to the lack of sufficient demand for rubber waste. It is also due to the fact that other fields are far more remunerative at present. For example, much of the unskilled labor employed formerly at gathering and preparing rubber scrap, is now chopping and selling fire wood and earning almost five times as much as formerly. Enormous quantities of rubber scrap are accumulating throughout the country.

THE RUBBER TRADE IN GREAT BRITAIN.

By Our Regular Correspondent.

MANUFACTURERS in nearly all branches of the trade report being extremely busy, many of the larger works continuing to be mainly engaged upon governmental work. Two of the largest plants in the Manchester district have recently been added to the list of factories "controlled" by the Ministry of Munitions, which means, *inter alia*, that their profits are limited to 20 per cent above their normal pre-war profits.

The position with regard to the raw rubber market is more tranquil than in the immediate past, it being generally recognized that there is sufficient rubber for all likely demands.

The rush up to the dollar line occurred without any good reason, a fictitious market being created owing to the fact that both Russia and the United States were large buyers at the same time. The freight question of course remains, and will continue to influence the market, though too much has been made in some quarters of the diversion of the traffic from the Suez Canal to the Cape route, which only takes seven or eight days longer. Manufacturers generally are looking forward to rubber at 2*s.* 6*d.* or 3*s.* per pound.

Busy as rubber manufacturers are, they have plenty of worries to contend with, such as shortage of labor, high prices of chemicals, internal transit difficulties, etc. Women are being increasingly employed in place of men, and with quite satisfactory results.

THE EDITOR.

The modest announcement in the January INDIA RUBBER WORLD of the election of Henry C. Pearson as a Fellow of the Royal Geographical Society of London came as an interesting and appreciative item of news to British readers, to many of whom Mr. Pearson is personally known. It has been said of some of the Fellows that they have obtained their entry to the society too easily; in other words, that the amount or the nature of the ground they have covered has been too limited. No objection of this sort can be justly made in the present case by those who know Mr. Pearson's wanderings in rubber producing regions.

SIR CLEMENTS R. MARKHAM.

The society has come into prominence lately by reason of the death of one of its oldest and most prominent fellows. I refer of course to Sir Clements R. Markham. By the way, in the various obituary notices which I have read I have not seen any reference to his journey to Panama in company with Robert Cross, of Liverpool, to obtain seeds and cuttings of the *Castilloa* tree. No doubt this was not of as much importance as the quinine business, but the ultimate outcome of this journey has proved by no means of an insignificant nature.*

*It was our belief that, while Sir Clements R. Markham was the active head of the Panama expedition, he did not go with it, but sent Mr. Cross.—THE EDITOR.

RUBBER COLLARS.

I have never worn a rubber or celluloid collar, though they have long had admirers. One of the numerous changes of procedure which the war has brought about is the greater use of these collars, mainly by the better class of workmen, and sales have been very brisk. This is not attributable to the higher cost of linen collars because these, if anything, have been cheaper, owing to the number of men wearing khaki collars. The cause is due rather to the increase in laundry charges, which have shown a substantial rise.

WRINGER ROLLS.

Specializing in the rubber industry has long been a feature of American practice, while in Great Britain it has been customary for factories to make a wide range of goods. Wringer rolls for domestic washing machines were at one time largely imported from America, and for all I know this may be the case today. There is now, however, a small rubber works, the Acme Rubber Co., situated in a suburb of Glasgow, where these goods are the sole product. It has by no means a monopoly of this business as many of our large works also make these goods. I mention the case as an interesting example of specialization—a procedure which is uncommon with us.

REMOVAL OF WORKS.

Some months ago I mentioned that the Burnett Motor Tire & Rubber Co. had commenced manufacturing at the Limpley Stoke Works, formerly occupied by Wallington, Weston & Co., Limited. The premises, being too small, the Burnett company has removed a few miles to larger works at Trowbridge.

LETTER FROM FRANCE.

By Our Regular Correspondent.

UNDER war conditions solid rubber tires have not been averaging better than from 1,500 to 2,000 miles, less than one-tenth of what is expected from them in commercial use. These low war mileages have been attributed to bad roads, overloading, over-speeding, constant exposure to the elements and to lack of proper attention. Some trouble is being experienced with quality which is far below the average peace time standard. This condition is not due to lack of crude rubber, for we have more than we can use, but to lack of skilled labor which for a time was scarcely felt.

From a mechanical point of view trucks in our army use are in much better condition than is usual in commercial service. Wheels out of parallel which grind the life out of tires and which are fairly common in commercial trucks are rare. One feature of war service that certainly helps to explain low mileages is that trucks are constantly under heavy loads. Temporary shortage of correct sizes and the necessity of keeping trucks in constant service have often led to the use of too small tires.

Interesting results have been obtained by using oversize tires; 110 millimeter (4½-inch) tires have in many instances outlasted two sets of 90 and 100 millimeter (3½ and 4-inch) tires for identical service.

In spite of many difficulties French tire manufacturers have been well able to supply all demands. Rubber has always been plentiful, but certain other raw materials have often been scarce.

In the early months of the war numerous American trucks were imported with American tires and American rim sizes. Our army has been altering these inch-size rims so that they can receive standard French-made tires. All new American trucks now coming into the country are built to receive French tire sizes.

The Société Française B. F. Goodrich is the only American tire concern with a plant in France, but the United States Tire Co. has for some time had a representative studying conditions here. The Goodrich plant near Paris manufactures both solid and pneumatic tires and inner tubes and also imports finished tires. The French customs-duty makes the profitable sale of American

tires difficult. While American demountable solid rubber tires have been received here with little confidence, they have developed no serious troubles.

GENERAL NOTES.

The "Bulletin du Caoutchouc," the only rubber plantation financial paper published in France, recently resumed publication. This journal, which was founded five years ago, is devoted exclusively to the promotion of Malaya rubber plantation shares. Writing on exchange this paper states that rubber plantations cause 400,000 francs [$77,200] of gold to come each month into France. In this manner rubber plantations indirectly do their share in improving the rates of exchange.

The Société Industrielle des Téléphones, which owns and operates several large cable and general rubber goods factories in this country, recently held its annual meeting of shareholders. The report submitted for the fiscal year 1914-15 showed that, after deducting all costs, including 350,000 francs [$67,550] distributed among the families and dependents of employes now under arms, the net profits to be distributed among shareholders amounted to 1,800,155 francs [$347,430].

The city of Lyons, which in France is second only to Paris in population, is organizing sample fairs to occur each year during the first fortnight of March. As indicated, these fairs will be strictly for showing samples and taking orders for future delivery. It is hoped to restore to Lyons the immense trade that was done there at fairs held in the Middle Ages. It is announced that a number of French, Swiss, Italian and British rubber firms will be represented.

New patent legislation here gives power to the Ministers of War and Marine to exploit, either in State or private factories, inventions of interest to our army and navy which are patented or deposited for patent. French subjects or foreigners domiciled in France are prohibited from applying abroad for patents referring to inventions of interest to any branch of our military services.

EUROPEAN TRADE NOTES.

SWITZERLAND.

Heinrich Stadelmann has started to manufacture rubber elastic fabric in Egg.

DENMARK.

The firm of Augustinus and Hansen, commission agents in waterproof garments, 29-31, Pilestrade, Copenhagen, was recently incorporated under the name of Augustinus and Hansen A. G., to manufacture rainproof garments. The directors are Ejnar Hansen and Kay Heiberg-Jürgensen. The stock capital, fully paid, is 50,000 crowns ($13,400).

Vald. Foersom has taken over the business of Fritz Christensen, at 27, Amagertoro, Copenhagen, and will deal in rubber footwear and general rubber goods.

According to the "Kraks Vejviser 1916," a directory published in Copenhagen, the following wholesale rubber goods concerns were organized in Copenhagen during 1915:

A. Alexander, Vester Boulevard 36.

Dahl & Nielsen, Aktieselskab, Kjöbmagergade 63-65. Capital stock 200,000 crowns ($53,600).

Max Möller, Havnegade 55 (mechanical rubber goods, packings and asbestos goods).

Hjalmar Maag, Kjöbmagergade 9 (general agents and dealers in surgical instruments and fittings).

SWEDEN.

The Boras Band och Hängslefabriks Aktiebolag, Boras, manufacturer of rubber bands and garters, reports 300,000 crowns [$80,400] profits earned during the year 1914-1915, and an 8 per cent dividend.

Aktiebolaget P. Ericsson & Co., Gothenburg, manufacturers of waterproof tents, covers and the like, have paid a dividend of 12 per cent out of 400,000 crowns [$107,200] profits earned during the year 1914-1915.

The firm of Alfred Lindahls Import Aktiebolag, Västergatan 33, Malmö, importer, manufacturer and dealer in rubber and rubber proofed garments has divided 102,000 crowns [$27,336] profits among its shareholders which amounts to a dividend of 7 per cent.

Aktiebolaget Bilringer is the name of a new 50,000 crown [$13,400] company recently incorporated in Stockholm to deal in automobile tires and accessories.

Herman Kunze, founder of Herman Kunze's Maskinförön-denhetsaffär, 5 Hamngatan, Gothenburg, wholesale dealers in asbestos goods, belts, packings and general rubber mechanical goods, has been elected to the first chamber of the Swedish parliament.

Stockholms Gummifabrik has been organized in Stockholm by Paul A. Person.

THE RUBBER SITUATION IN THE GUIANAS.

By a Resident Correspondent.

MISLEADING statements have been made concerning *Hevea* diseases here which I am glad to say have been disproved in many quarters in these colonies. If these statements were left uncontradicted the rubber industry in the Guianas would have suffered materially.

The Governor of British Guiana at a meeting held on December 2, 1915, said:

> There is no reason to fear that the diseases now prevalent in some districts will prove more formidable than others which have been successfully fought and conquered here and elsewhere. The Director of Science and Agriculture has informed me he is certain C. K. Bancroft, M.A., F.L.S., the government botanist, can tackle it successfully.

The disease must be fought. In Dutch Guiana every effort is being spent in stamping it out. Efforts must be made to conquer it at its first appearance. All the rubber growers in British Guiana are advised the moment they suspect the presence of this or any other disease to get at once into communication with the Department of Agriculture.

At one time the tendency existed, if any planter was under the impression that his cultivation was being attacked by disease, to keep the matter as quiet as possible and avoid communication with the responsible authorities. Disease was looked upon as something that was bound to come but would in the course of time disappear. We now know that whenever a large number of plants of the same species are brought together by artificial means, it is almost a certainty that disease of some kind will creep in. A plant under plantation conditions foreign to its natural habits, is particularly liable to disease. What is not so clearly recognized by the planter is that if disease is to be successfully fought it must be tackled at once. If the planters delay adopting remedial and preventive methods, should the conditions happen to be favorable to the development of any particular disease, that disease will surely spread, or it will take so firm a grip upon his plantation that the expense of eradicating it may possibly cause his ruin.

So, too, with this leaf disease of Para rubber, said to be prevalent on certain plantations in the Guianas. Immediately it appears steps should be taken to combat with it. In all probability it may prove a disease of no great danger, but on the other hand sufficient is known of it to conclude that it can, under certain conditions, prove a grave menace to the rubber planter.

We in the Guianas, so far as we can learn, do not suffer from root disease of *Hevea*, which causes so much anxiety in the East. Hence, if our plantations are free from *Fomes semitostus* we should be all the more prepared to get rid of a leaf disease

which is so obviously more easily detected and treated than a root disease.

An example of the damage that can be done by certain diseases is seen in the witchbroom disease of cacao. This disease, where conditions are favorable, can and does prove most disastrous. The cacao industry of Dutch Guiana was practically ruined by the witchbroom disease, and in British Guiana the planter here and there were also victims to this terrible plague. The coffee industry of Ceylon was ruined many years ago by disease which would probably in these days have been tackled and the industry saved.

From exhaustive investigations in the Guianas, it has been discovered that the soil in neither of the colonies is responsible for the leaf disease. The Department of Agriculture at Dutch Guiana is at present very busy with its examinations, and it is expected by the middle of 1916 its report will appear before the world.

In British Guiana, 1,932 pounds of rubber were exported in 1914-15 as against 1,292 pounds exported in 1913-14, an increase of 640 pounds. Of this amount 380 pounds was collected from crown lands and paid royalty, the rest was from private properties.

The rubber cultivation on leased crown lands at the Hills Estate, right bank of the Mazaruni river, and of the Consolidated Rubber and Balata Estates, Limited, at Aliki, right bank of the Essequibo river, have been maintained. Cultivation of rubber has been commenced by the latter company on 43 acres of the recently leased land, Koriabo, on the left bank of the Aruka river, North West district, adjoining the Government Experimental Station at Issorora, the rubber being interplanted with catch crops.

The tapping of rubber trees was carried out at the Government Experimental Station at Christianburg and Issorora, and at the David Young's property, Aruka, now owned by the Consolidated Rubber & Balata Estates, Limited, and excellent biscuits obtained from the latex.

A showcase owned by the Permanent Exhibitions Committee of the Board of Science and Agriculture and containing samples of rubber and balata, has been placed in the Museum buildings, with the consent of the directors of the Royal Agriculture and Commercial Society.

The cultivation of rubber on the sugar estates in Demerara and other freehold properties in that colony have been maintained, and the production from such sources ought soon to be apparent.

The estimated area under rubber cultivation in the whole colony of British Guiana, according to the reports from the Department of Lands and Mines, on March 31, 1915, was 4,962 acres.

The low price of rubber has had the effect of diverting attention from the cultivation of this product, and there has been no large increase in area cultivated, but it is possible that interest may be revived after the war, when an improvement in the market is looked for.

In Dutch Guiana, the industry during 1915 cannot be said to have suffered any material loss. The trees on most of the estates are all nearly ready for tapping and, had it not been for the war in Europe, many planters would have reported good shipments. It would seem, however, that the trouble in Europe is a blessing in disguise for the industry in the Dutch colony for, after the war, prices are expected to be high. The estates will be then in a better position to profit by the long cessation from tapping and the trees will, it is hoped, be entirely freed from the leaf trouble.

It is unfortunate, however, for Dutch Guiana, that the Holland element introduced from the East Indies to fill responsible positions are men of very little feeling for the country. A recent importation, who arrived a few weeks back to report on a rubber estate, has discovered already that Dutch Guiana is unsuited for rubber and that the Far East is ideal. I could quote instances where these East Indian experts are prejudiced against the country long before they set foot on the soil.

The balata industry in the Guianas suffered considerably during 1915 and bleeding operations were practically suspended. In British Guiana, however, the royalty collected on this product during the year was $24,946.35, as against $29,590.86, or a decrease of $4,644.51. Notwithstanding the adverse conditions in that colony caused on account of the war, the production was very satisfactory and had the war not occurred, the year would have bid fair to have been a record one.

The following are the companies that carried on operations during the year with the quantity of balata on which royalty was paid by each:

Consolidated Rubber & Balata Estates, Limited	*pounds*	788,061½
Garnett & Co., Limited		143,286
Thom & Cameron, Limited		73,614
M. Bugle & Co.		65,771
British Guiana Balata Co., Limited		26,271
H. L. Rongeiron		14,554
C. A. Parrett		11,121
Edward Maurer		9,191
Evan Wong		8,536
P. F. Smith		5,654
W. H. Patoir		2,665
Total		1,148,724½

It will be seen that the chief operators were the Consolidated Rubber & Balata Estates, Limited, whose holdings represent the tracts formerly owned by Garnetts, McKinnon, Downer, Davson —chief balata pioneers of the past. Four new balata collecting licenses were issued and 65 licenses canceled for failure to pay the rentals due thereon, leaving 678 in existence at the close of the year.

The bleeding of balata by Indians on the reservations was continued from April to October, 1914, when the issue of permits was discontinued owing to the difficulty in disposing of the substance on account of the war. There was, notwithstanding, collected by the Indians from the Berbice and Pomeroon reservations, 19,559 pounds of balata which produced in revenue to the government $1,955.90.

Dutch Guiana's balata crop began in May, 1915, owing to the new regulations which upset the entire machinery of the industry, but fortunately an order to cancel the laws reached the colony just in time to avert a crisis. However, from May to December 31, 1915, the colony produced 564,380 kilograms [1,128,760 pounds].

The war severely hampers the industry, as it is not possible to export balata to Europe and, there is no demand from the United States; if, however, the prices were attractive, good business could be effected by sending the bulk of balata produced in the Guianas to the United States.

French Guiana produced a fairly large crop during 1915, but no figures have yet come to hand. Very much activity, however, is displayed by the French people and there is a great rush for the balata forests on the Maroni, where very extensive tracts are untouched, especially on the Mini and Spirning creeks, where the trees are within easy reach from the landing places.

GERMAN IMPORTS AND EXPORTS OF WASTE.

Under paragraph 98d of the German tariff, rubber waste is included with gutta percha and balata waste. The latest available statistics of this trade, which are for the year 1913, are reprinted from the "Gummi-Zeitung," which says that no statistics have been given out since the beginning of the war.

GERMAN IMPORTS AND EXPORTS.

		IMPORTS.	EXPORTS.
Belgium	*pounds*	407,000	306,460
France		1,236,180	298,540
Great Britain		1,861,200	4,217,400
Holland		319,220	443,960
Austria-Hungary		1,406,020	446,600
Russia		490,600	187,000
Sweden		239,020	.....
United States		603,460	2,508,000
Other countries		1,443,320	173,140
Totals		8,006,020	8,581,100
Total Values		$649,502	$658,308

Rubber Planting Notes.

RUBBER TAPPING IN SOUTH KURG, INDIA.

CONSIDERABLE falling off in the yield of latex from the Ceara rubber trees has been noted in South Kurg, India, during the prevalence of overcast wet weather. Better yields are obtained when the nights are clear and dewy, provided there be no wind to dry up the latex in the cuts and stop its flow. The latex that is thus dried in the wounds is sometimes collected as scrap rubber, other times it is left to assist bark renewal. Vertical tapping is most easily performed by the coolies, who are expected to bring in 60 to 80 ounces of latex a day. It takes less time and they can attend to a greater number of trees than with the herring-bone or half herring-bone systems, but the most economical method has to be determined by the quantity of latex the trees yield under each system.

The vertical system consists in cutting a vertical channel from a height of about 6 feet to within 6 inches of the ground and then paring off one side of this channel. It has been found impracticable to tap during the southwest monsoon so that, allowing for one inch in breadth of the surface to be pared away in a month, three inches breadth is necessary for the three months season during which Ceara is tapped. Tapping can be continued for an extra month in May, after the growth of new leaves, but the best yields are always obtained during November, December and January.

If the consumption of bark surface is 6 feet by 3 inches a season, it will allow only two wounds being made in a tree 36 inches in circumference, one on each half of the tree a season, as the tapping must be arranged so that the newest bark will not be cut until it is three years old.

Paring of the bark on each side of the vertical channel is not advisable because it leaves too large a wound.

Another method of vertical tapping is to leave strips of cortex between the cuts in order to assist in bark renewal. The advantage of this system is that the guards of the tapping knives can be set so as to guard against injury to the cambium. Where strips of bark are left between the cuts, the guard of the tapping knife moves over the hard upper rind in advance of the cutting blade. If this guard has been properly set the cambium can not be touched. A tapped surface never recovers the smoothness of the original bark except when new layers of wood and bark grow in from the sides over bad wounds.

The best yields have so far been obtained from full herring-bone tapping, but the drawback is that half of the tappable surface has to be worked on each season and the Ceara tree is too delicate to stand such treatment. Experts are of the opinion that coolies should not be ordered to bring in a fixed quantity of latex daily, as they are likely to be led to make too deep cuts thus damaging the trees. Daily tappings are preferable for Ceara to tapping on alternate days.

FRENCH AFRICAN RUBBER.

Writing on the subject of commercial relations between French Equatorial Africa and the Russian Empire the "Petit Bulletin de l'Office Colonial," published in Bordeaux, France, states that rubber is probably the only product of this French colony that possibly could be sold in almost unlimited quantities in Russia. Up to the outbreak of the war, this trade was monopolized by German traders and brokers who imported the rubber, mixed it with other qualities, and resold it to the Russian manufacturers. The purchsers were thus unable to appreciate the qualities of "nerve," elasticity and strength of the French African wild rubber.

YIELDS OF RUBBER PER ACRE.

Occasional references to exceptionally heavy yields of rubber per acre by plantation companies tend to cause the fact to be overlooked that the average production of the whole planted area of any given estate is on quite a moderate scale, says the London "Financial Times." Some interest was aroused a few years ago by a yield of 1,300 pounds per acre on a small part of one estate, but this excessive output was followed by a drop in the following year. Even the giant producers do not as a rule average 300 pounds per acre over the whole planted area, although this is generally explained by the inclusion of large areas not in bearing.

Anglo Malay reached 345 pounds per acre over the whole planted portion last year, Batu Caves 356 pounds and Batu Tiga 367 pounds per acre, and others which exceed the 300 pounds limit include Ulu Rantau, Tremelbye, Sungei Salak, Sungei Buloh, Seafield, Rubber Estates of Johore, Perak, Pataling, London Asiatic, Kurau, Kuala Selangor, Kamuning and Chersonese.

The following table shows the yield per acre of a number of companies whose reports have recently appeared:

POUNDS PER PLANTED ACRE.

	1914.	1915.
Braunston ..... *pounds*	162	214
Mullinghall	72	132
Langen (Java)	154	223
Lumut	173	226
Ratanui	235	251
Sendayan	194	243
Taiping	186	249
United Serdang	190	257

The above list may be regarded as a representative selection of good class companies. It will be seen that on the basis of a yield in full bearing of 400 pounds to 500 pounds per acre there exists plenty of scope for increase from the present planted acreage.

ILCKEN-DOWN LATEX COAGULATING METHOD.

The acetic acid and similar methods of coagulating rubber latex have long been the accepted process in the Far East, therefore a new method, recently patented, is interesting. A. C. Ilcken and St. V. B. Down are the inventors.

The apparatus consists of a circular zinc latex tank provided with a cover and stirring device. An injector with a 1/32-inch opening is fitted to the bottom of the tank, and connected by a rubber tube with another tank that contains benzine and methylated spirit—the precipitating mixture.

The latex is first measured, and then put in the tank and stirred. When it commences to thicken the precipitating mixture is forced into the tank by a foot pump, stirring being continued in the meantime. The coagulum forms rapidly, and after a short interval it is removed from the tank and crêped.

FLOODS AND LANDSLIDES IN JAVA.

Some anxiety was recently caused among those interested in Java rubber plantations by news from Batavia of landslides and floods. The opinion is expressed in the London rubber share market that the disaster will not affect the rubber planting industry as most of the rubber estates are remote from the scene of the inundations.

VODKA SYNTHETIC RUBBER AND THE CEYLON PLANTERS.

The story that the Russian Government was going to use its vast stock of vodka for making synthetic rubber created no more than passing comment in Ceylon. The rubber planters still remember artichoke rubber and other vague synthetic rubber announcements and require something more definite to make them believe that synthetic rubber manufacturing had been established on a commercial basis.

Recent Patents Relating to Rubber.

THE UNITED STATES.

ISSUED JANUARY 25, 1916.

No. 1,169,123. Combination hot water bottle and ice bag. M. E. Burns, Chicago, Ill.

1,169,218. Solid tire. W. W. Wildman and E. A. Tinsman, assignors to The Portage Rubber Co.—all of Barberton, Ohio.

1,169,277. Tire valve. J. N. Newsom, assignor to W. H. Morgens—both of St. Louis, Mo.

1,169,301. Valveless atomizer. S. Trask, San Francisco, Cal.

1,169,324. Horseshoe pad. C. W. Dunning, Los Angeles, Cal.

1,169,361. Inflatable floating device for flying machines. P. Siptrott, Brooklyn, N. Y.

1,169,380. Self-adjusting hat conformer with elastic tube and cord. L. Cohen, St. Louis, Mo.

1,169,389. Hose coupling. H. Forsman, Fresno, Cal.

1,169,455. Supporter comprising an elastic belt. C. F. Bennett, assignor to Sharp & Smith—both of Chicago, Ill.

1,169,459. Air brake coupling with electrical conductor. A. J. Campbell, Marion, Ia.

1,169,500. Child's garment with elastic garters. N. C. Leavitt, Newark, N. J., and I. Mink, Brooklyn, N. Y., said Mink assignor to said Leavitt.

1,169,524. Hose sprayer. L. S. Baker, Pasadena, Cal.

1,169,525. Antiskidding device. M. P. Bixby and F. C. Reimer—both of Great Falls, Mont.

1,169,562. Rubber overshoe with elastic retaining toe band. F. W. Ostrom, Newark, N. J.

1,169,575. Wheel tread comprising a body of resilient material. W. Seidel, Chicago, Ill.

1,169,585. Billiard table cushion rail and rubber cushion. M. J. Whelan, Muskegon, Mich., assignor to The Brunswick-Balke-Collender Co., Chicago, Ill.

1,169,603. Self-filling fountain pen with soft rubber tube. D. W. Beaumel, Brooklyn, N. Y.

1,169,712. Lathering device with a rubber bulb. G. Zingali, Montclair, N. J.

1,169,746. Sectional tire. C. F. Lighthouse, New York City, assignor to Lighthouse Tire Co., Guttenberg, N. J.
Re issue.

14,056. Self adjusting inner tube protector. C. L. Witsaman, Cuyahoga Falls, assignor to the Firestone Tire & Rubber Co., Akron—both in Ohio.

ISSUED FEBRUARY 1, 1916.

1,169,757. Hose supporter. J. G. Allen, Racine, Wis.

1,169,804. Toy balloon. T. M. Gregory, Akron, Ohio.

1,169,888. Waterproof cover or shield for cycles. J. S. Tulloch, Cashmere, Christchurch, New Zealand.

1,169,908. Rim, with pneumatic tire carrying ring. H. J. Arend, Quincy, Ill.

1,169,918. Inner tube testing device. B. S. Bowers, Laprairie, Minn., assignor to J. Closz, St. Ansgar, Ia.

1,169,964. Inner tube protector. W. N. Kelley and J. C. Porter—both of Pittsburgh, Pa.

1,169,984. Elastic wheel with solid tire. M. Mettler, Leipzig, Germany.

1,170,173. Hose rack. C. O. Lund, Brooklyn, N. Y., assignor of one-half to Carlund Manufacturing Co., New York, N. Y., and one-half to W. D. Allen Manufacturing Co., Chicago, Ill.

1,170,185. Rubber covered button for hose supporters. V. Price, New York, and J. H. Sanderson, Brooklyn, assignors to C. J. Higley, New York—all in New York.

1,170,220. Rubber eraser. J. A. Coyle, Baltimore, Md.

1,170,222. A package of elastic garters. J. P. Croasdale, Berwyn, assignor to Pioneer Suspender Co., Philadelphia—both in Pennsylvania.

1,170,354. Nipple for nursing bottles. J. Skydel, New York City.

1,170,412. Valve for tires. W. A. Campbell, Maricopa, Cal.

1,170,477. A chain for a tire guard. A. E. Chernack, Providence, R. I.

1,170,497. Solid tire tread. W. T. Bogan, assignor of one-half to W. W. Porter—both of Philadelphia, Pa.

ISSUED FEBRUARY 8, 1916.

1,170,597. Pneumatic cord tire. C. L. Archer, Council Bluffs, Iowa.

1,170,695. Demountable rim band. H. A. Soulis, assignor of one-half to W. T. Soulis—both of New York City.

1,170,781. Elastic garter. H. E. Penn, assignor to Penn Brothers Suspender Co., Inc.—both of Madison, N. C.

1,170,825. Fountain pen with rubber ink sack. J. A. Kraker, assignor to Kraker Pen Co.—both of Kansas City, Mo.

1,170,828. Game apparatus operated by elastic cord. S. R. Lamb, New York City.

1,170,875. Hose supporter with elastic webbing. S. Buyer, New York City.

1,170,923. Fountain shaving brush with rubber bulb. C. Malkin, San Francisco, Calif.

1,170,937. Automobile wheel having an alternating elastic and non-elastic block tire. E. H. Rundle, Longmont, Colo.

1,170,957. A tubular metal tire with rubber tread. A. B. Burt, San Francisco, Calif.

1,171,090. Stuffing box packing. G. H. Cook, Poplar, London, England.

1,171,147. Tire valve. M. C. Schweinert, West Hoboken, N. J.

1,171,214. Spring tire with rubber tread. H. M. Lambert, assignor to Lambert Multiplus Co.—both of Portland, Ore.

1,171,238. Football cover. G. L. Pierce, Brooklyn, N. Y., assignor to A. G. Spaulding & Bros. Manufacturing Co., Jersey City, N. J.

1,171,247. Rubber thread or cord. H. K. Raymond, Akron, Ohio, assignor to The B. F. Goodrich Co., New York City.

1,171,373. Demountable rim. P. S. Whiting, Akron, Ohio, assignor to M. E. Whiting, Wayne county, Mich.

THE DOMINION OF CANADA.

ISSUED NOVEMBER 30, 1915.

165,768. Combination pneumatic and solid tire. T. A. Hall, Bethlehem, Pa., and C. G. O. Hall, Cleveland, Ohio.

165,809. Wrapper for tire casings. E. Hopkinson, New York City.

165,819. Rubber footwear holder. A. G. Moore, Pownall, Prince Edward Island, Canada.

165,861. Rubber sole. United States Rubber Co., assignee of F. Boyle—both of New York City.

165,868. Rubber heel. Goodyear Tire & Rubber Co., assignee of I. R. Bailey—both of Akron, Ohio.

165,917. Rubber soled boot or shoe. G. F. Butterfield, West Newton, Mass.

165,974. Rubber heel. A. C. Rightor, Pittsburgh, Pa.

165,979. Demountable rim. S. E. Siggelkow, Marbury, Ala.

166,021. Demountable rim. The Standard Welding Co., assignee of R. S. Bryant—both of Cleveland, Ohio.

166,119. Rubber boot. The Canadian Consolidated Rubber Co., Limited, Montreal, Quebec, assignee of A. H. Steen and H. McNulty—both of Berlin, Ontario—all in Canada.

166,249. Pneumatic tire. The American Tire Co., assignee of M. A. Dees—both of St. Louis, Miss.

166,270. Solid tire. The Gutta Percha & Rubber Co., Ltd., assignee of J. H. Coffey, and J. H. Coffey, Jr.—all of Toronto, Ontario, Canada.

166,281. Inner tube for pneumatic tires. The Reinforced Inner Tube Co., assignee of J. H. Poole—both of Brockton, Mass.

166,333. Armored pneumatic tire. R. W. Davis, Philadelphia, Pa.

166,381. Puncture proof pneumatic tire. J. A. Shearer, Methuen street, Prospect, South Australia.

166,384. Pneumatic tire casing with a layer of compressed cotton. C. V. Roberts, Ocala, Florida.

166,391. Pneumatic tire protector. A. F. Tiedge, Bay Bridge, Ohio.

166,393. Tire with elastic cushion. P. C. Traver, Far Rockaway, N. Y.

THE UNITED KINGDOM.

PATENT SPECIFICATIONS PUBLISHED.

The number given is that assigned to the Patent upon the filing of the application.

**Denotes Patents for American Inventions.*

[ABSTRACTED IN THE ILLUSTRATED OFFICIAL JOURNAL, JANUARY 12, 1916.]

19,821 (1914). Method of detachably securing heels and soles. A. E. Layton, Mill House, Winterton, Norfolk.

19,888 (1914). Non-skid plates for dual solid tires. G. H. Green, 25 Ouseley Road, Balham, London.

[ABSTRACTED IN THE ILLUSTRATED OFFICIAL JOURNAL, JANUARY 19, 1916.]

20,187 (1914). Photographic developing device comprising rubber tubing and bulb. J. A. L. Gimblette, 110 Cambridge Gardens, and G. V. Rowden, 31 Longridge Road—both in Kensington, London.

20,311 (1914). Rubber ball valve for feeding bottles and invalid cups. W. F. Carr-Hill, 37 Walbrook, London.

20,378 (1914). Method of attaching covers to tennis or rubber balls. E. C. Wisden-Luff, and J. Wisden & Co.—both of 23 Cranbourn street, London.

*27,654 (1914). Tread attachments to rims. C. F. Forster, 235 South Grove avenue, Oak Park, Ill.

12,170 (1914). Footballs, etc. J. Nielson, 485 Clarkston Road, Cathcart, Scotland.

[ABSTRACTED IN THE ILLUSTRATED OFFICIAL JOURNAL, JANUARY 26, 1916.]

20,498 (1914). Block tire. L. Linden, 117 rue Belliard, Brussels.

20,519 (1914). Inhaler with rubber buffer. E. A. Mays, 35 Newhall street, Birmingham.

20,549 (1914). Lead covered cable. C. J. Beaver, Rangemoor, Crescent Road, Hale, and E. A. Claremont, Broom Cottage, High Legh—both in Cheshire.

20,570 (1914). Life belt with inflatable bags and elastic bands. W. Portsmouth, Windham House, Windham Place, Southampton.

20,630 (1914). Inflatable life-saving armlet. R. F. Hislop, Greenhill House, Paisley, Renfrewshire.

20,659 (1914). Rectangular waterproof sheet for use as a coat, tent or stretcher. E. Terry, 117 Loughborough Park, Brixton, London.

20,600 (1914). Boats and toy fishes propelled by rubber cord. H. J. Chart, Westbury, Carlton Road, Putney, London.

(ABSTRACTED IN THE ILLUSTRATED OFFICIAL JOURNAL, FEBRUARY 9, 1916.)

21,035 (1914). Tire valve. R. Walmsley, Clyde Road, and G. C. Dagnall, Rushton street—both in Didsbury, Manchester.

*21,060 (1914). Rubber fabric protector in making patent leather footwear. J. A. Kelly, 2039 North Park avenue, Philadelphia, Pa.

21,164 (1914). Toy submarine with rubber bladder. T. Burney, 101 Gloucester Place, Portman Square, London.

*21,173 (1914). Pneumatic tire with leather puncture protector. A. F. Tiedge, Bay Ridge, Ohio.

THE FRENCH REPUBLIC.

PATENTS ISSUED (With Dates of Application).

477,513 (February 3, 1915). Improvements in vehicle wheels. A. Wallace.

477,537 (June 19, 1914). Improvements in revolving heels for footwear. D. Klein.

477,617 (December 12, 1914). Fabric composed of thin superposed layers, intersecting one another and joined together by an adhesive substance. L. A. Subers.

477,647 (February 10, 1915). Pneumatic suspension for automobile bodies. W. G. Wood.

477,657 (February 11, 1915). Elastic wheel. W. H. Dane and de Lukacsevics.

477,666 (February 12, 1915). Elastic wheel. G. F. Pinsuti and Miss Talvard.

477,669 (February 13, 1915). Improvements in elastic bandages. W. H. Heina.

477,785 (February 24, 1915). Pneumatic tire with a non-continuous, detachable tread, with or without a metallic armor, and provided with a puncture-proof inner tube. M. J. B. Maubon and F. C. G. Carré.

NEW ZEALAND.

ISSUED DECEMBER 9, 1915.

35,742. Milking machine teat cup. T. N. Fletcher, Hamilton, New Zealand.

35,786. Milking machine teat cup. A. B. Robertson, Westown, New Plymouth, New Zealand.

36,466. Pneumatic tire cover. The Azulay Syndicate, Ltd., 8 Laurence Pountney Hill, Cannon street, London, E. C., England.

TRADE-MARKS.

THE UNITED STATES.

ISSUED JANUARY 25, 1916.

89,172. Perry-Malcolm Co., Haverhill, Mass. The word *Pymal*. For shoes made of rubber, etc.

90,030. The International Rubber Co., Denver, Colo. The words *Half-Sole Tire*. For rubber tires.

90,484. The Miller Rubber Co., Akron, Ohio. The word *Sanitate*. For nipples, non-collapsible.

91,048. The United States Asphalt Refining Co., New York, N. Y. The word *Rubrax*. For asphalt base filler used for mixing with rubber, etc.

91,049. The United States Asphalt Refining Co., New York, N. Y. The word *Infulax*. For an asphalt base filler used for insulating wire, etc.

91,079. National India Rubber Co., Bristol, R. I. The word *Week-End*. For rubber and canvas boots, shoes and slippers.

91,352. Mishawaka Woolen Manufacturing Co., Mishawaka, Ind. The word *Plato*. For light weight rubber shoes.

91,426. The B. F. Goodrich Co., New York, N. Y. Illustration of a double circle with the words *Double Duty* in the inner one. For soles composed of rubber and a fibrous filler for boots and shoes.

91,521. Mishawaka Woolen Manufacturing Co., Mishawaka, Ind. The word *Kalo*. For light weight rubber shoes.

91,688. Mishawaka Woolen Manufacturing Co., Mishawaka, Ind. The word *Alco*. For light weight rubber shoes.

91,689. Mishawaka Woolen Manufacturing Co., Mishawaka, Ind. The word *Corso*. For light weight rubber shoes.

91,727. Mishawaka Woolen Manufacturing Co., Mishawaka, Ind. The word *Beth*. For light weight rubber shoes.

91,728. Mishawaka Woolen Manufacturing Co., Mishawaka, Ind. The word *Neko*. For light weight rubber shoes.

91,744. Mishawaka Woolen Manufacturing Co., Mishawaka, Ind. The word *Hero*. For light weight rubber shoes.

91,745. Mishawaka Woolen Manufacturing Co., Mishawaka, Ind. The word *Inka*. For light weight rubber shoes.

91,746. Mishawaka Woolen Manufacturing Co., Mishawaka, Ind. The word *Nora*. For light weight rubber shoes.

ISSUED FEBRUARY 1, 1916.

89,505. Coppedge Specialty Co., Winston-Salem, N. C. Portrait of a man with the words *Dad-Gum*. For chewing gum.

90,407. The Firestone Tire & Rubber Co., Akron, Ohio. Illustration of a tire. For rubber tires and casings.

90,563. Motor Supplies Manufacturing Co., Minneapolis, Minn. The words *Perma Tite Tire Patch*. For tire patches.

90,618. Samstag & Hilder Bros., New York, N. Y. Illustration of a coat of arms with a shield and a crown with the word *Colonial*. For bathing caps made of rubber alone or rubber and mercerized cotton and silk.

ISSUED FEBRUARY 8, 1916.

86,058. Schacht Rubber Manufacturing Co., Huntington, Ind. The word *Daisy*. For sink, bath and basin stoppers, plugs, bumpers, etc.

86,727. C. L. Coleman, Chicago, Ill. The words *Coleman Sweet Karamel Ko-Ko-Tulu*. For chewing gum.

90,190. National India Rubber Co., Bristol, R. I. The word *Overland*. For boots, shoes and slippers having rubber soles vulcanized to fabric uppers.

90,511. Goodyear Tire & Rubber Co., Akron, Ohio. The word *Neolin* in the center of a circle. For soles and heels for boots and shoes formed of an artificial composition.

90,699. J. W. Glenn, Buffalo, N. Y. Illustration of a kewpie with the words *Kewpie Rose O'Neill*. For chewing gum.

91,266. I. B. Kleinert Rubber Co., New York City. The word *Paraloid*. For waterproof sheeting for surgical and sanitary use.

91,668. The Charles William Stores, Inc., Brooklyn, N. Y. Picture of a bridge within a circle with the initials *C W S* and the word *Bridge*. For hose supporters.

DESIGNS.

THE UNITED STATES.

ISSUED FEBRUARY 8, 1916.

48,524. Tire. E. F. Lyon, Chicago, Ill.

48,541. Tire. J. C. McLean, Lakewood, Ohio.

THE DOMINION OF CANADA.

ISSUED NOVEMBER 30, 1915.

3,929. Rubber tire. F. D. Law, Toronto, Ont.

3,932. Automobile tire tread. Gutta Percha & Rubber, Limited, Toronto, Ont.

THE RUBBER SCRAP MARKET.

THE sentiment of the rubber scrap market for the month that has just passed has been decidedly bullish. Last month's excitement subsided early in February, but the general situation has remained unchanged and firm throughout and the expected downward trend of prices has not materialized.

Boots and shoes continued to be the leading feature in the market. The extremely inclement weather and consequently slow collections from outlying sources resulted in firm prices. Sales were made to the mills early in the month at 11½ cents delivered but for large quantities, 11¾ to 12 cents was asked. During the last week of the month the market weakened due to the arrival of considerable stocks, and boots and shoes were sold at 10¾ to 11 cents.

The tire situation has been quite uninteresting. Values have remained firm with the same levels as last month; however, during the latter part of the month the market eased off and lower prices were freely predicted. G. and G. white tires were quoted at 8¾ cents; auto tires mixed at 6¼ cents. Inner tubes were selling at 29 to 30 cents in a firm market supported by the strong position of crude rubber. Bicycle tires have shown a slight gain during the month and 4 cents is the present price to the mills.

The balance of the list has recorded slight advances in price since our last market report and actual buying has only been normal in volume. Mechanicals, however, were in good demand at prices that show advances of ¼ to ½ cent a pound.

It is estimated that 183,000 tons of casings and tubes will be scrapped during 1916.

NEW YORK QUOTATIONS FOR CARLOAD LOTS DELIVERED.

FEBRUARY 29, 1916.

Prices subject to change without notice.

	Per Pound.
Boots and shoes	$0.10¾ @ .11
Trimmed arctics	.08½ @ .08¾
White tires, Goodrich and Goodyear	.08½ @ .08¾
Auto tires, standard white	.06½ @
standard mixed	.06½ @
stripped, unguaranteed	.04 @ .04¾
Auto peelings, No. 1	.09½ @ .10
No. 2	.09 @
Inner tubes, No. 1	.29 @ .30
No. 2	.12¾ @ .13
red	.13½ @ .14
Irony tires	.02½ @ .02¼
Bicycle tires	.04 @
Solid tires	.05¾ @ .06
White scrap, No. 1	.13 @ .14
No. 2	.10 @ .11
Red scrap, No. 1	.10½ @ .11
No. 2	.08 @ .08½
Mixed black scrap, No. 1	.04½ @
No. 2	.04 @
Rubber car springs	.04½ @ .05
Horse shoe pads	.04¼ @ .04½
Matting and packings	.01 @ .01½
Garden hose	.01¾ @ .02
Air brake hose	.06 @ .06¼
Cotton fire hose	.02½ @ .02¾
Large hose	.02 @ .02¼
Hard rubber scrap, No. 1, bright fracture	.26 @
Battery jars (red compound)	.03 @
Insulated wire stripping	.04 @ .04½
Rubber heels	.04 @

Review of the Crude Rubber Market.

NEW YORK.

IT was freely predicted early in the month that February would very likely be a period of comparative quiet in trading and that lower prices would rule. With the exception of values, however, the above forecast has been fairly well supported by the market conditions that have prevailed during the past month.

On February 1, First latex and Smoked sheet nearby, were quoted at 76 cents, with very little difference in prices for future deliveries of these sorts. Upriver fine was selling for 73 cents.

The generally quiet tone that has dominated the market during the month would justify the belief that the manufacturers had already bought heavily during the recent period of high prices. The small orders that had been placed this month by the large consumers would indicate an interest only in immediate requirements.

Forward deliveries were very uncertain due to the lack of cargo space and shipments from the Far East were very slow—90 days is not unusual when shipments are routed via Cape of Good Hope.

Values, however, have ranged upward, and strongly reflect the firm market that has generally prevailed in London. Prices continued to advance steadily and on February 18, First latex, nearby, was quoted at 91 cents. Smoked sheet, prompt shipment, was 89 cents and Upriver fine, nearby, was firm at 77 cents. Then the market developed an easier tendency and prices declined due to lack of local support and heavy arrivals from London.

The last week of the month witnessed considerable activity in Beaver street and prices again advanced. This condition is evidently due to the scarcity of rubber in the primary markets and the steady demand from the consuming interests. On February 29, First latex, spot was quoted at 93 to 94 cents and Upriver fine, 77 to 78 cents.

The arrivals at the port of New York for the first 17 days of February total 5,000 tons in round numbers. Plantation imports head the list, with 2,200 tons from London and Liverpool and 1,200 tons from Colombo and Singapore. Other imports were, 23 tons Para rubber from London and Liverpool; 84 tons Para from Para and Manaos; 110 tons, Centrals; 87 tons Plantation, from Rotterdam; 540 tons, Africans; 1500 pounds Plantation from Paramaribo, Dutch Guiana.

There is every indication that the New York imports for February, 1916, will fall short of 9,400 tons, the figures for January—the largest monthly receipts since March and April, 1915, when 10,500 tons and 10,150 tons, respectively, were imported.

LONDON.

This market has been well supported at critical periods during the past month and prices in all positions have recorded steady advances. This firmness of the market is due in part to American requirements and the recent heavy buying orders from Russian sources. These movements have had a steadying effect on values at this time when large stocks are accumulating and arrivals are congesting the docks at Liverpool and London.

An unusual circumstance was noted during the past month in that futures were at a premium over spot rubber.

That sufficient rubber is being produced to meet the world's requirements is not doubted. That rubber prices should be normal is theoretically true. But, the fundamental difficulty that constantly threatens the rubber market is the question of shipping.

PARA AND MANAOS.

There has not been much demand for spot rubber in the Amazon markets for the past month. February is one of the months when heavy rubber receipts are expected, which thus far have been abundantly realized. Rubber has been steadily coming in for the past three weeks and consequently prices are weak and easier. There is a difference of 15 cents per pound, according to New York quotations, February 24, between First latex, Plantation and Upriver fine in favor of the former. Another reason why there is so little buying movement in Para sorts.

SINGAPORE.

Competitive buying seems to have been the cause of recent price advances in Singapore. It is reported that representatives of the large rubber manufacturers, with open buying orders, were bidding against each other with the effect of bulling the market.

It is almost impossible to secure sufficient cargo space to accommodate the demands of rubber shippers. There is an increasing amount of rubber going to the United States by the way of Kobe, Japan, and Hongkong, China.

The following are the freight rates from Singapore to Boston and New York via the Suez or Panama Canal on rubber and allied products:

Rubber scrap (cases)	$36.45 per 50 cubic feet.
Gutta jelutong (cases) (Pontianak)	38.88 per 50 cwt.
Gutta re-boiled or mixed not exceeding 24 cents per pound (c. i. f. in cases).	41.31 per 50 cubic feet.
Borneo rubber (baskets)	48.60 per 12 cwt.
Borneo, Para and rubber, genuine (cases)	48.60 per 50 cubic feet.
Gutta percha (cases)	51.03 per 50 cubic feet.
Rubber, genuine (bags or bundles)	72.90 per 20 cwt.

The through rate on rubber in cases from Port Swettenham is $52.25 per 50 cubic feet. The rate on rubber in cases by steamers calling at Port Swettenham is $48.60 per 50 cubic feet. [The equivalent of a ton (2,240 pounds) is figured at 40 cubic feet, a hundred weight (cwt.) 112 pounds.]

NEW YORK QUOTATIONS.

Following are the quotations at New York one year ago, one month ago, and February 29, the current date:

PARA.	March 1, '15.	Feb. 1, '16.	Feb. 29, '16.
Upriver, fine, new	58½@	76 @	77 @ 78
Upriver, fine, old	60 @	.....	72 @
Islands, fine, new	50 @	69 @	70 @ 71
Islands, fine, old	.....	.....	.....
Upriver, coarse, new	45 @ 46	54 @	59 @ 60
Upriver, coarse, old	.....	.....	.....
Islands, coarse, new	28 @	35 @	37 @ 38
Islands, coarse, old	.....	.....	.....
Cameta	32½@ 33	37 @	40 @ 41
Caucho, ball, upper	46 @ 48	59 @ 61	61 @ 62
Caucho, ball, lower	43 @ 44	56 @	58 @ 59
PLANTATION HEVEA.			
Smoked sheet ribbed: Spot 65@66; Prompt shpt. 62½@63		78 @	Spot 92@93; Apr.-June 92@93½; July-Dec. 89@
First latex crepe: Spot 62@63; Prompt shpt. 60½@61		78 @	Spot 93@94; Apr.-June 93@94½; July-Dec. 90@
Fine sheets and biscuits, unsmoked	59 @ 60	78 @	Spot 91@
CENTRALS.			
Corinto	44 @ 45	55 @ 56	57 @ 59
Esmeralda, sausage	44 @ 45	54 @ 55	57 @ 59
Nicaragua, scrap	.....	53 @ 54	56 @ 57
Mexican plantation, sheet	43 @ 44	60 @ 61	60 @
Mexican, scrap	.....	53 @ 54	53 @
Mexican, slab	.....	35 @ 36	38 @ 40
Manicoba	.....	45 @ 46	50 @ 52½
Mangabeira, sheet	37½@ 40	35 @ 38	42 @ 45
Guayule	.....	41 @ 42	48 @
Balata, sheet	56 @ 57	64 @	66 @ 67
Balata, block	45 @ 46	46 @	45 @ 46
AFRICAN.			
Lopori, ball, prime	.....	.....	.....
Lopori, strip, prime	.....	.....	59 @
Upper Congo, ball, red	.....	.....	62 @
Rio Nunez Niggers	.....	72 @	72 @ 73
Conakry Niggers	.....	76 @ 77	74 @ 75
Massai, red	51½@ 52½	71 @ 72	74 @ 75
Soudan Niggers	.....	.....	.....
Cameroon, ball, soft	.....	.....	46 @
Cameroon, ball, hard	.....	.....	50 @
Benguela No. 2	.....	40 @ 41	46 @ 48
Accra, flake	23 @ 24	40 @	38 @ 40
EAST INDIAN.			
Assam	.....	.....	58 @
Pontianak	7½@ 8	8½@ 8¾	10 @ 10½
Gutta Siak	.....	13 @ 13½	15 @ 16½
Gutta red Niger	.....	.....	27½@
Borneo III	.....	35 @ 35½	.....
Gutta Percha	.....	1.50 @ 2.00	1.50 @ 2.00

RUBBER AFLOAT TO THE UNITED STATES.

PLANTATION.

Steamship.	Cleared.	From.	To.	Pounds.
Yangtze	Dec. 10, 1915	Penang	*Akron and Seattle.	44,275
Sardinia	Dec. 11, 1915	Penang	†New York	4,480
Inverclyde	Dec. 17, 1915	Penang	New York	124,324
Inverclyde	Dec. 17, 1915	Penang	Boston	20,160
Namur	Dec. 25, 1915	Penang	†New York	6,795
Pyrrhus	Dec. 25, 1915	Penang	†New York	8,963
Total from Penang				208,997
Pyrrhus	Dec. 22, 1915	Singapore	New York	22,400
Kasenga	Dec. 24, 1915	Singapore	New York	14,367
Hyson	Dec. 25, 1915	Singapore	*San Francisco	3,467
Hyson	Dec. 25, 1915	Singapore	Seattle	188,000
Hyson	Dec. 25, 1915	Singapore	Akron	41,467
Hyson	Dec. 25, 1915	Singapore	New York	216,800
Asia Maru	Dec. 26, 1915	Singapore	Seattle	422,267
Asia Maru	Dec. 26, 1915	Singapore	New York	116,667
Atsuta Maru	Dec. 26, 1915	Singapore	*San Francisco	152,933
St. Jacob	Dec. 28, 1915	Singapore	Akron	78,400
St. Jacob	Dec. 28, 1915	Singapore	New York	159,067
Van Spilbergen	Dec. 29, 1915	Singapore	Akron	89,600
Mongara	Jan. 6, 1916	Singapore	New York	75,333
Mongara	Jan. 6, 1916	Singapore	Akron	95,198
Total from Singapore				1,675,966

GUTTA JELUTONG (PONTIANAK).

St. Jacob	Dec. 28, 1915	Singapore	*San Francisco	26,933

*Via Hong Kong. †Via London.

New York.

In regard to the financial situation, Albert B. Beers (broker in crude rubber and commercial paper, New York City), advises as follows:

During February the market for commercial paper continued about the same as in January, there being a good general demand from city banks and out of town, the best rubber names selling readily at 4 per cent, and those not so well known at 4½@5½ per cent, according to grade.

NEW YORK PRICES FOR JANUARY (NEW RUBBER).

	1914.	1915.	1916.
Upriver fine	$0.73@0.77	$0.61@0.75	$0.77@0.99
Upriver coarse	.44@ .47	.45@ .58	.60@ .76
Islands fine	.59@ .65	.53@ .70	.75@ .90
Islands coarse	.27@ .31	.29@ .37	.35@ .53
Cametá	.35@ .37	.31@ .41	.39@ .54

NEW YORK PRICES FROM FEBRUARY 1 TO 26 (NEW RUBBER).

	1914.	1915.	1916.
Upriver fine	$0.75@0.79	$0.57@0.61	$0.73@0.80
Upriver coarse	.46@ .47	.44@ .48	.52@ .60
Islands fine	.64@ .69	.50@ .54	.67@ .74
Islands coarse	.31@ .32	.28@ .32	.35@ .38
Cametá	.35@ .38	.30@ .36	.37@ .40

Plantation Rubber from the Far East.

TOTAL EXPORTS FROM MALAYA.

(From January 1, 1915, to dates named. Reported by Barlow & Co., Singapore. These figures include the production of the Federated Malay States, but not of Ceylon.)

To—	Singapore. November 30, 1915.	Malacca. December 31, 1915.	Penang. November 30, 1915.	Port Swettenham. January 2, 1916.	Total.
Great Britain *pounds*	27,664,267	7,881,651	22,125,665	774,253	58,445,836
Continent	4,310,933	17,333	801,599	.....	5,129,865
Japan	2,315,915	.....	.....	.....	2,315,915
Ceylon	248,450	.....	516,666	47,192	812,308
United States	42,692,667	.....	4,132,467	.....	46,825,134
Australia	372,459	.....	.....	.....	372,459
Totals	77,604,691	7,898,984	27,576,397	821,445	113,901,517
Same period, 1914	37,566,695	5,318,379	20,009,367	*2,052,620	64,947,061
Same period, 1913	24,803,020	.....	12,925,467	1,366,990	39,095,477
Same period, 1912	13,689,653	.....	4,057,932	735,677	18,483,262

*From January 1 to January 8.

EXPORTS OF CEYLON GROWN RUBBER.

(From January 1 to 17, 1915 and 1916. Compiled by the Ceylon Chamber of Commerce.)

To—	1915.	1916.
Great Britain *pounds*	253,956	876,530
Canada and Newfoundland	122,290	.....
France	6,720	.....
United States	.....	1,069,361
Australia	.....	22,416
Totals	382,966	1,968,307

(Same period 1914, 521,357 pounds; same period, 1913, 481,560.)

The export figures for 1914 include the imports re-exported. (These amount to 63,815 pounds.) To arrive at the total quantity of Ceylon rubber exported for that period deduct these imports from the total exports. The figures for 1915 and 1916 are for Ceylon rubber only.

SINGAPORE.

Guthrie & Co., Limited, report [January 12, 1916]:

The rubber auction held today opened slowly and proceedings were very dull throughout.

Some very heavy declines in values have to be reported, the most notable being in fine pale crêpe which, at $186, was down $23. Fine ribbed smoked sheet was neglected and most parcels were quickly withdrawn. One lot fetched $187, but the average price obtained for the grade did not exceed $179.

Ribbed and plain unsmoked sheet were $20 and $23 lower, at $170 and $167 respectively.

The lower grades came in for special attention and most parcels put up found ready buyers although at lower prices, the average decline being about $14. Scrap shared in the general depression.

Of some 350 tons catalogued only 10 per cent. changed hands. The following was the course of values:

	In Singapore. Picul.*	Sterling equivalent per pound in London.	Equivalent per pound in cents.†
Sheet, fine ribbed smoked	$180@187	3/ 4¼@3/ 6¾	82.60@85.64
Sheet, fair to good ribbed smoked	170@181	3/ 2¾@3/ 5	78.55@83.11
Sheet, plain smoked	175@180	3/ 3¼@3/ 4¾	80.58@82.60
Sheet, ribbed, unsmoked	167@170	3/ 2 @3/ 2¾	77.03@78.55
Sheet, plain, unsmoked	165@167	3/ 1⅝@3/ 2	76.27@77.03
Crêpe, fine pale	184@186	3/ 5⅜@3/ 6	84.37@85.14
Crêpe, good pale	179@182	3/ 4⅜@3/ 5¼	82.35@83.62
Crêpe, fine brown	177@183	3/ 4⅛@3/ 5⅜	81.33@83.87
Crêpe, good brown	164@178	3/ 1⅜@3/ 4⅛	75.76@81.84
Crêpe, dark	147@169	2/ 9⅞@3/ 2½	68.66@78.04
Crêpe, bark	120@157	2/ 4½@3/	57.27@72.98
Scrap, virgin	112@113	2/ 2½@2/ 2¾	53.72@54.22
Scrap, pressed	126@....	2/ 5½@.....	59.80@.....
Scrap, loose	75@107	1/ 6¾@2/ 1½	38.01@51.70

*Picul = 133 1/3 pounds.
†Figured at standard rate of exchange 1s. = 24.3 cents.
Quoted in S. S. dollars = 2/4 [56 cents].

STRAITS SETTLEMENTS RUBBER EXPORTS.

A cablegram from the government to the Malay States Information Agency gives the exports of plantation rubber from the Straits Settlements for the month of December as 3,005 tons compared with 4,292 tons in November last and 2,334 tons in the corresponding month of 1914. The total export for the year 1915 was 34,891 tons compared with 19,727 tons in 1914 and 11,889 tons in 1913.

It is interesting to note the enormous development of the rubber industry during the past few years in the Malay Peninsula. So recently as 1912, the total export from British Malaya (Straits Settlements, Federated Malay States and Unfederated States) amounted to 21,305 tons. In the year just closed the total export was 79,415 tons, or more than half of the whole world's production of wild and plantation rubber.

Appended are the comparative statistics for three years:

	1913.	1914.	1915.
January *tons*	784	1,181	2,576
February	743	1,703	2,741
March	898	1,285	2,477
April	762	1,548	1,978
May	814	1,309	3,588
June	812	1,480	2,249
July	1,120	1,584	2,324
August	1,315	1,325	2,295
September	1,057	1,602	4,725
October	1,144	2,006	2,641
November	1,223	2,370	4,292
December	1,217	2,334	3,005
Totals	11,889	19,727	34,891

FEDERATED MALAY STATES RUBBER EXPORTS.

An official cablegram from Kuala Lumpur announces that the export of plantation rubber from the Federated Malay States during the month of January amounted to 4,471 tons compared with 3,473 tons in the corresponding month last year and 2,542 tons in 1914.

CRUDE RUBBER IMPORTS AND EXPORTS OF UNITED KINGDOM FOR JANUARY, 1916.*

IMPORTS.

	Pounds.		Value.	
From—	Jan., 1915.	Jan., 1916.	Jan., 1915.	Jan., 1916.
Dutch East Indies	633,200	573,000	$338,349	$434,868
French West Africa	20,400	138,000	8,879	73,459
Gold Coast	31,300	78,300	9,414	31,430
Other countries in Africa	887,300	526,900	349,609	249,245
Peru	71,000	281,500	34,939	200,699
Brazil	613,000	1,792,600	340,229	1,427,255
British India	487,000	527,800	249,989	436,997
Straits Settlements	7,727,800	5,061,500	3,909,394	3,962,348
Federated Malay States	2,443,200	3,134,600	1,340,879	2,462,805
Ceylon and dependencies	4,180,600	2,441,400	2,176,177	1,933,731
Other countries	213,100	224,200	120,178	172,063
Totals	17,307,900	14,779,800	$8,878,035	$11,384,900
Waste and reclaimed	104,500	609,800	$11,795	$81,833

EXPORTS—Foreign and Colonial.

	Pounds.		Value.	
To—	Jan., 1915.	Jan., 1916.	Jan., 1915.	Jan., 1916.
Russia	737,200	504,500	$382,419	$365,355
France	687,900	1,539,300	371,484	1,145,590
United States	766,600	4,873,200	389,553	3,530,776
Other countries	2,041,700	1,680,300	1,075,766	1,127,995
Totals	4,233,400	8,597,300	$2,219,222	$6,169,716
Waste and reclaimed	18,700	24,700	$2,712	$4,073

*Complete United Kingdom statistics for January, 1916, will appear in the April issue.

CRUDE RUBBER ARRIVALS AT THE PORT OF NEW YORK.

IMPORTS FROM PARA.

[The Figures Indicate Weight in Pounds.]

JANUARY 8.—By the steamer *Atahualpa* from Iquitos:

	Fine.	Medium.	Coarse.	Caucho.	Total.
H. C. Kupper	43,700	.....	21,000	29,700=	94,400
W. R. Grace & Co.	26,800	2,000	24,300	18,500=	71,600
H. A. Astlett & Co.	22,500	7,200	14,000	23,600=	67,300
J. T. Johnstone & Co.	27,700	.....	7,400	1,700=	36,800
G. Amsinck & Co.	12,600	800	4,500	12,400=	30,300
Chartered Bank of Spanish America	7,900	.....	1,200	10,200=	19,300
Rumsey & Greutert Co., Inc.	1,900	.....	1,700	3,300=	6,900
Totals	143,100	10,000	74,100	99,400=	326,600

JANUARY 25.—By the steamer *Minas Geraes* from Pará:

Meyer & Brown	131,100	14,500	113,800	139,900=	399,300
G. Amsinck & Co.	176,300	16,200	32,800	19,800=	245,100
Arnold & Zeiss	90,700	22,000	47,400	40,700=	200,800
Paul Bertuch	104,900	1,100	48,900	22,600=	177,500
H. A. Astlett & Co.	53,900	17,500	59,500	43,300=	174,200
Henderson & Korn	65,700	.....	81,100	.....=	146,800
W. R. Grace & Co.	27,700	.....	.....	59,900=	87,600
J. T. Johnstone & Co.	.....	.....	13,200	21,500=	34,700
Robinson & Co.	7,100	700	5,300	.....=	13,100
F. D. Duen & Co.	4,300	.....	.....	.....=	4,300
Totals	661,700	72,000	402,000	347,700=	1,483,400

JANUARY 29.—By the steamer *Frances* from Pará and Manàos:

Meyer & Brown	15,400	12,500	37,700	96,000=	161,600
General Rubber Co.	311,100	48,900	93,200	3,300=	456,500
G. Amsinck & Co.	174,200	11,800	110,700	37,600=	334,300
Arnold & Zeiss	157,900	15,500	43,500	74,900=	291,800
Alden's Successors, Ltd.	171,700	55,800	66,700	7,700=	301,900
Robinson & Co.	173,600	.....	35,500	13,000=	222,100
Henderson & Korn	121,600	22,700	28,500	25,200=	198,000
H. A. Astlett & Co.	64,900	15,000	45,800	30,000=	155,700
W. R. Grace & Co.	25,800	1,100	6,600	.....=	33,500
F. B. Ross & Co.	19,400	.....	10,000	2,300=	31,700
Pell & Dumont	11,100	5,700	9,000	4,400=	30,200
Cowdrey & Co.	.....	.....	1,100	.....=	1,100
Totals	1,246,700	189,000	488,300	294,400=	2,218,400

FEBRUARY 8.—By the steamer *Hubert* from Pará:

Meyer & Brown	49,100	4,600	20,200	61,900=	135,800
Arnold & Zeiss	35,700	10,200	63,700	23,200=	132,800
G. Amsinck & Co.	21,100	1,800	29,700	.....=	52,600
H. A. Astlett & Co.	35,400	13,600	60,300	9,000=	118,300
Henderson & Korn	25,800	2,600	14,500	8,600=	51,500
Davies, Turner & Co.	50,300	.....	22,000	129,100=	201,400
W. R. Grace & Co.	67,100	3,200	2,700	21,300=	94,300
Alden's Successors, Ltd.	.....	2,100	4,400	.....=	6,500
Hagemeyer & Brunn	6,400	400	4,200	.....=	11,000
Totals	290,900	38,500	221,700	253,100=	804,200

FEBRUARY 14.—By the steamer *Sao Paulo* from Pará and Manàos:

Meyer & Brown	101,200	11,200	50,200	83,000=	245,600
G. Amsinck & Co.	162,800	19,700	24,900	56,200=	263,600
Arnold & Zeiss	63,800	6,700	19,600	3,800=	93,900
Alden's Successors, Ltd.	.....	19,700	70,400	1,200=	91,300
Paul Bertuch	46,700	.....	14,800	18,500=	80,000
H. A. Astlett & Co.	10,600	2,400	52,800	200=	66,000
Henderson & Korn	1,700	1,100	15,300	6,500=	24,600
W. R. Grace & Co.	5,700	400	2,000	.....=	8,100
F. B. Ross & Co.	900	100	100	.....=	1,100
Davies, Turner & Co.	17,500	2,100	5,200	6,600=	31,400
Totals	410,900	63,400	272,500	176,000=	905,600

PARAS FROM EUROPE.

		Pounds.
JANUARY 24.—By the *Cymric*=Liverpool:		
Alden's Successors, Ltd (Fine)		143,700
JANUARY 27.—By the *Alliança*=Colon:		
G. Amsinck & Co. (Caucho)	4,000	
W. R. Grace & Co. (Fine)	6,500	
Gravenhorst & Co. (Fine)	3,200	13,700
FEBRUARY 3.—By the *Colon*=Colon:		
G. Amsinck & Co. (Fine)	8,500	
W. R. Grace & Co. (Fine)	2,200	10,700
FEBRUARY 14.—By the *Cristobal*=Colon:		
G. Amsinck & Co. (Fine)	14,300	
G. Amsinck & Co. (Caucho)	17,300	
W. R. Grace & Co. (Fine)	3,000	
Cowdrey & Co. (Fine)	1,400	
Eastmond & Co. (Fine)	900	36,900

EAST INDIAN AND AFRICANS.

		Pounds.
JANUARY 24.—By the *Quebra*=Liverpool:		
Robert Badenhop Co.	22,500	
J. T. Johnstone & Co.	22,500	45,000
JANUARY 27.—By the *Cuñc*=Liverpool:		
General Rubber Co.		6,000
JANUARY 27.—By the *Indradeo*=Batavia:		
General Rubber Co.	160,000	
Various	40,000	200,000
JANUARY 29.—By the *Lapland*=Liverpool:		
Various		33,500
JANUARY 31.—By the *Asnarca*=Lisbon:		
Various		7,000
FEBRUARY 1.—By the *Uranus*=Lisbon:		
W. H. Stiles	60,000	
S. R. Sequerra	78,000	138,000
FEBRUARY 4.—By the *Ardgryfe*=London:		
J. T. Johnstone & Co.	3,000	
Robert Badenhop Co.	7,000	10,000
FEBRUARY 5.—By the *Chicago*=Bordeaux:		
Rubber Trading Co.	25,000	
Rumsey & Greutert Co., Inc.	11,200	36,200
FEBRUARY 7.—By the *Foyle*=Liverpool:		
Arnold & Zeiss	142,000	
Robert Badenhop Co.	47,000	
Various	6,000	195,000
FEBRUARY 8.—By the *Cannizaro*=Hull:		
Alden's Successors, Ltd.		230,000
FEBRUARY 9.—By the *Sarnia*=Lisbon:		
S. R. Sequerra		245,000
FEBRUARY 10.—By the *Den of Ogil*=Liverpool:		
Meyer & Brown	11,200	
Arnold & Zeiss	75,000	
Various	22,500	108,700
FEBRUARY 14.—By the *Adriatic*=Liverpool:		
Various		31,200
FEBRUARY 14.—By the *Saxon Monarch*=London:		
J. T. Johnstone & Co.		6,000
FEBRUARY 16.—By the *Idaho*=Hull:		
J. T. Johnstone & Co.		22,500
FEBRUARY 16.—By the *Orduna*=Liverpool:		
Robert Badenhop Co.	15,000	
Rubber Trading Co.	17,000	
Goodyear Tire & Rubber Co.	22,500	54,500
FEBRUARY 17.—By the *Galileo*=Hull:		
J. T. Johnstone & Co.		11,200

CENTRALS.

		Pounds.
JANUARY 24.—By the *Tivives*=Puerto Barrios:		
Rosenthal & Sons	3,000	
E. H. Vivie	500	3,500
JANUARY 24.—By the *Pastores*=Port Limon:		
Gontard & Co.	1,200	
Isaac Brandon & Bros.	1,000	
G. Amsinck & Co.	600	
Meyer Hecht	300	
Commercial Bank of Span. Am.	300	
H. Marquardt & Co.	200	3,600
JANUARY 27.—By the *Alliança*=Colon:		
G. Amsinck & Co.	6,300	
W. R. Grace & Co.	4,600	
Lawrence Johnson & Co.	42,800	
Pablo, Calvet & Co.	25,200	
Isaac Brandon & Bros.	700	
Fidanque Bros. & Sons	300	79,900
FEBRUARY 1.—By the *Calamares*=Port Limon:		
Isaac Brandon & Bros.	3,000	
United Fruit Co.	500	
Kunhardt & Co.	500	4,000
FEBRUARY 3.—By the *Colon*=Colon:		
G. Amsinck & Co.	12,500	
Otto Gerdau Co.	12,000	
Lawrence Johnson & Co.	6,000	
Andean Trading Co.	5,100	
American Trading Co.	4,500	
Gontard & Co.	1,600	
Chartered Bank Spanish Am.	200	41,900
FEBRUARY 3.—By the *Guantanamo*=Mexico:		
American Trading Co.		27,000
FEBRUARY 4.—By the *Carrillo*=Cartagena:		
De Lima, Cortissoz & Co.	1,500	
Andean Trading Co.	1,000	
Pottberg, Ebeling & Co.	500	
G. Amsinck & Co.	100	3,100
FEBRUARY 8.—By the *Esperanza*=Mexico:		
J. A. Medina & Co.	1,500	
Graham, Hinkley & Co.	1,200	
General Export & Commission Co.	800	
H. Marquardt & Co.	300	
Various	8,000	11,800
FEBRUARY 8.—By the *Siraola*=Puerto Barrios:		
Rosenthal & Sons	1,500	
FEBRUARY 8.—By the *Denadores*=Port Limon:		
G. Amsinck & Co.	7,000	
Mecke & Co.	3,500	
Isaac Brandon & Bros.	1,000	
A. A. Linde & Co.	500	
A. Held	700	12,700
FEBRUARY 11.—By the *Santa Marta*=Cartagena:		
G. Amsinck & Co.	1,500	
A. Held	700	2,200
FEBRUARY 14.—By the *Cristobal*=Colon:		
G. Amsinck & Co.	24,800	
A. M. Capen's Sons	3,500	
Camacho, Roldan & Van Sickel	2,000	
Lawrence Johnson & Co.	12,100	
Pablo, Calvet & Co.	2,800	
R. G. Barthold	800	
Mecke & Co.	1,600	
American Trading Co.	4,700	
Lanman & Kemp	1,500	
Pottberg, Ebeling & Co.	4,800	
Gravenhorst & Co.	5,400	
C. E. Manuel	2,500	66,500
FEBRUARY 14.—By the *Comus*=New Orleans:		
E. Steiger & Co.	32,000	
Lanman & Kemp	4,500	
Harburger & Stack	4,000	
G. Amsinck & Co.	1,500	
Ph. Neider	1,500	
H. Miller	1,000	44,500
FEBRUARY 16.—By the *Metapan*=Port Limon:		
Isaac Brandon & Bros.		700
FEBRUARY 18.—By the *Manzanillo*=Mexico:		
American Trading Co.		6,000

MANICOBA AND CAUCHO.

		Pounds.
JANUARY 23.—By the *Minas Geraes*=Pernambuco:		
J. H. Rossbach Bros.		8,500
JANUARY 25.—By the *Minas Geraes*=Bahia:		
Alden's Successors, Ltd.	9,200	
Various	10,800	28,500
FEBRUARY 7.—By the *Foyle*=Liverpool:		
Arnold & Zeiss		4,500
FEBRUARY 8.—By the *Scottish Prince*=Bahia:		
Adolph Hirsch & Co.	45,000	
J. H. Rossbach Bros.	29,500	74,500
FEBRUARY 7.—By the *Foyle*=Liverpool:		
Arnold & Zeiss		17,000
FEBRUARY 8.—By the *Hubert*=Ceara and Pernambuco:		
F. B. Ross & Co.	100,000	
J. H. Rossbach Bros.	35,000	
Various	60,000	195,000
FEBRUARY 8.—By the *Hubert*=Natal:		
Herbst Bros. (Manicoba)		13,500

FEBRUARY 8.—By the *Hubert*=Parnahyba:

J. H. Rossbach Bros (Manicoba)	5,500	

PLANTATIONS.

	Pounds.	
JANUARY 22.—By the *Philadelphian*=London:		
Goodyear Tire & Rubber Co	40,000	
JANUARY 24.—By the *Cymric*=Liverpool:		
General Rubber Co	40,000	
JANUARY 24.—By the *Siberia*=London:		
Alden's Successors, Ltd	278,400	
General Rubber Co	225,000	
Goodyear Tire & Rubber Co	100,000	
Michelin Tire Co	56,000	
Raw Products Co	4,500	663,900
JANUARY 24.—By the *Newquay*=Colombo:		
Meyer & Brown	210,000	
L. Littlejohn & Co	300,000	
Goodyear Tire & Rubber Co	120,000	
Arnold & Zeiss	130,000	
Edward Maurer Co., Inc	112,000	
J. T. Johnstone & Co	135,000	
Henderson & Korn	16,000	
W. R. Grace & Co	4,500	
W. H. Stiles	2,000	
Various	14,000	1,043,500
JANUARY 26.—By the *Kenkon Maru No. 5*=Singapore:		
L. Littlejohn & Co	340,000	
Henderson & Korn	190,000	
General Rubber Co	38,000	
Edward Maurer Co., Inc	85,000	
Goodyear Tire & Rubber Co	20,000	
Charles T. Wilson & Co., Inc.	70,000	
Robert Badenhop Co	125,000	
Arnold & Zeiss	168,000	
Robinson & Co	22,500	1,058,500
JANUARY 27.—By the *Cufic*=Liverpool:		
General Rubber Co	6,000	
JANUARY 27.—By the *Indradeo*=Batavia:		
Meyer & Brown	156,000	
Goodyear Tire & Rubber Co	250,000	
Henderson & Korn	22,500	
G. Amsinck & Co	90,000	
Edward Maurer Co., Inc	125,000	
W. R. Grace & Co	45,000	
General Rubber Co	340,000	
J. T. Johnstone & Co	75,000	
W. H. Stiles	3,500	
Manhattan Rubber Manufacturing Co.	40,000	
Stein, Hirsch & Co	45,000	
Arnold & Zeiss	9,000	
Rubber Trading Co	2,000	
Alden's Successors, Ltd	4,500	
Various	115,500	1,323,000
FEBRUARY 1.—By the *Manchuria*=London:		
Goodyear Tire & Rubber Co	35,000	
FEBRUARY 1.—By the *Noordam*=Rotterdam:		
Rubber Trading Co	12,000	15,000
Various	3,000	
FEBRUARY 2.—By the *Mesaba*=London:		
Meyer & Brown	78,000	
Edward Maurer Co., Inc	92,000	
W. H. Stiles	45,000	
Rumsey & Greutert Co., Inc	70,000	
Alden's Successors, Ltd	228,000	
Robert Badenhop Co	9,000	
Charles T. Wilson Co., Inc	39,000	
Goodyear Tire & Rubber Co	27,000	588,000
FEBRUARY 4.—By the *Ardgryfe*=London:		
Meyer & Brown	70,000	
Henderson & Korn	2,200	
Robert Badenhop Co	4,500	
Edward Maurer Co	52,000	
Rubber Trading Co	10,000	
General Rubber Co	80,000	
Rumsey & Greutert Co., Inc	9,000	
Michelin Tire Co	60,000	
J. T. Johnstone & Co	7,000	
Alden's Successors, Ltd	301,000	
Arnold & Zeiss	40,000	
Charles T. Wilson & Co., Inc	33,500	
W. H. Stiles	33,500	
Various	1,200	703,900
FEBRUARY 7.—By the *Harpathian*=Colombo:		
Meyer & Brown	71,000	
L. Littlejohn & Co	13,500	
W. R. Grace & Co	2,200	
W. H. Stiles	13,500	
J. T. Johnstone & Co	16,000	
Arnold & Zeiss	9,000	
Edward Maurer Co., Inc	67,000	
Various	18,000	210,200
FEBRUARY 7.—By the *Bolton Castle*=Singapore:		
Meyer & Brown	4,500	
J. T. Johnstone & Co	275,000	
H. A. Astlett & Co	22,500	
L. Littlejohn & Co	490,000	
Henderson & Korn	190,000	
Fred Stern & Co	48,000	
Goodyear Tire & Rubber Co	150,000	
Charles T. Wilson & Co., Inc	68,000	
Rubber Trading Co	4,000	
Alden's Successors, Ltd	5,600	
W. R. Grace & Co	9,000	
H. Jeffords	9,000	
Hood Rubber Co	7,000	
Rumsey & Greutert Co., Inc	3,000	
Various	4,500	1,290,100
FEBRUARY 7.—By the *Minnehaha*=London:		
General Rubber Co	225,000	
Rumsey & Greutert Co., Inc	56,000	
Goodyear Tire & Rubber Co	45,000	
J. T. Johnstone & Co	4,500	
Henderson & Korn	1,500	
Rubber Trading Co	20,000	352,000
FEBRUARY 8.—By the *Veendyk*=Rotterdam:		
Robert Badenhop Co	80,000	
Rubber Trading Co	59,000	
Various	21,000	160,000
FEBRUARY 14.—By the *St. George*=Liverpool:		
Goodyear Tire & Rubber Co	7,000	
FEBRUARY 14.—By the *Saxon Monarch*=London:		
Meyer & Brown	157,000	
J. T. Johnstone & Co	70,000	
Robinson & Co	18,000	
General Rubber Co	450,000	
Arnold & Zeiss	336,000	
Michelin Tire Co	27,000	
L. Littlejohn & Co	18,000	
Raw Products Co	9,000	
Charles T. Wilson & Co., Inc	50,000	
Edward Maurer Co., Inc	22,500	
W. H. Stiles	11,200	1,168,700
FEBRUARY 14.—By the *Inverclyde*=Singapore:		
Meyer & Brown	7,000	
Henderson & Korn	116,000	
Rubber Trading Co	14,000	
L. Littlejohn & Co	125,000	
Goodyear Tire & Rubber Co	75,000	
Robert Badenhop Co	22,500	
Arnold & Zeiss	22,500	
Charles T. Wilson Co., Inc	60,000	
Fox & Co	13,500	
Alden's Successors, Ltd	11,200	
J. T. Johnstone & Co	132,000	
W. H. Stiles	4,500	
W. R. Grace & Co	16,000	
Edward Maurer Co., Inc	31,500	
Various	81,700	732,400
FEBRUARY 14.—By the *Matura*=Paramaribo:		
Arnold & Zeiss	1,500	
FEBRUARY 14.—By the *St. Bede*=Singapore:		
L. Littlejohn & Co	105,000	
Arnold & Zeiss	11,200	
Fred Stern & Co	13,500	129,700
FEBRUARY 14.—By the *Kroonland*=London:		
Rumsey & Greutert Co., Inc	60,000	
Various	3,500	63,500
FEBRUARY 17.—By the *St. Kentigern*=London:		
Meyer & Brown	150,000	
J. T. Johnstone & Co	125,000	
W. R. Grace & Co	11,200	
Henderson & Korn	45,000	
Alden's Successors, Ltd	403,800	
General Rubber Co	470,000	
Edward Maurer Co., Inc	70,000	
Charles T. Wilson Co., Inc	20,00	
Rubber Trading Co	31,000	
Arnold & Zeiss	56,000	
Michelin Tire Co	50,000	
Robinson & Co	11,200	
W. H. Stiles	33,500	
Various	32,500	1,509,200

CUSTOM HOUSE STATISTICS.

PORT OF NEW YORK—NOVEMBER, 1915.

Imports:	Pounds.	Value.
India rubber	17,855,792	$8,670,047
Balata	268,182	95,721
Gutta percha	166,826	20,842
Gutta jelutong (Pontianak)	1,115,657	45,479
Rubber scrap	240,117	19,309
Totals	19,646,574	$8,851,398
Exports:		
India rubber, crude	56,000	$24,473
Indian rubber manufactures	.....	256
Gutta jelutong (Pontianak)	2,611	287
Gutta percha, crude	814	569
Rubber scrap	115,740	16,078
Reclaimed rubber	137,252	18,002
Totals	312,417	$59,665

PORT OF NEW YORK—DECEMBER, 1915.

Imports:		
India rubber	21,785,389	$11,646,534
Balata	257,298	93,747
Gutta percha	153,963	15,182
Gutta jelutong (Pontianak)	1,754,807	72,173
Totals	23,951,457	$11,827,636
Exports:		
Gutta percha, crude	13,645	$1,600
Rubber scrap	251,487	36,790
Rubber, reclaimed	65,332	7,019
Totals	330,464	$45,409

PORT OF BOSTON—JANUARY, 1916.

Imports:		
India rubber	22,414	$16,144
Gutta percha	5,066	304
Gutta jelutong (Pontianak)	113,466	4,932
Manufactures of india rubber	.....	1,041
Rubber scrap	58,148	5,173
Totals	199,094	$27,594
Exports:		
India rubber boots.....*pairs*	19,107	$38,536
India rubber shoes	32,292	13,211
Automobile tires	.....	118,045
Other rubber tires	.....	10
Belting, hose, etc	.....	6,881
All other manufactures of india rubber	.....	23,074
Total	.....	$199,757

PORT OF CLEVELAND—JANUARY, 1916.

Exports:		
India rubber	691,496	$332,659
Rubber scrap	55	3
Manufactures of india rubber	.....	542
Totals	691,551	$333,204

PORT OF DETROIT—JANUARY, 1916.

Imports:		
Rubber scrap	32,943	$2,028
Exports:		
Rubber scrap	75,672	$3,763

PORT OF NIAGARA FALLS—JANUARY, 1916.

Imports:		
Rubber scrap	20,886	$1,109
Exports:		
India rubber	342,637	$216,793
Rubber scrap	39,665	4,166
Reclaimed rubber	151,186	20,649
Totals	533,488	$241,608

PORT OF PHILADELPHIA—JANUARY, 1916.

Imports:		
Manufactures of india rubber	.....	$40

PORT OF SAN FRANCISCO—DECEMBER, 1915.

Imports:		
India rubber	378,577	$227,931

IMPORTS AND EXPORTS OF RUBBER AND RUBBER MANUFACTURES AT THE PORT OF NEW YORK.

IMPORTS.

	India Rubber.		Scrap for re-manufacture.		Balata.		Chicle.		Gutta Percha.	
Week Ending—	Pounds.	Value.	Pounds.	Value.	Pounds.	Value.	Pounds.	Value.	Pounds.	Value.
January 21, 1916	3,177,812	$1,902,447	14,290	$3,195	92,002	$25,823	21,287	$7,985	.....	.....
January 28, 1916	4,182,573	2,591,871	130,723	11,383	87,742	33,679	463	105	62,498	$7,059
February 4, 1916	662,453	4,295,997	119,835	14,118	33,397	10,225	49,392	28,180	1,084	810
February 11, 1916	2,860,304	1,833,912	96,136	6,548	70,829	34,079	8,929	2,794	92,680	8,968

In addition to the above, the following imports of gutta jelutong are recorded: January 21, 1916, from Straits Settlements, 231,121 pounds, value $9,905; January 28, 1916, from Straits Settlements, 99,054 pounds, value $49,521, and from the Dutch East Indies, 54,500 pounds, value $3,752; February 11, 1916, from Straits Settlements, 589,639 pounds, value $25,999, and from the Dutch East Indies, 45,057 pounds, value $2,602.

EXPORTS.

Figures issued from January 25, 1915, to February 24, 1916.

EXPORTED TO—	Belting, Hose and Packing.	Footwear. Boots.	Footwear. Shoes.	Tires. Auto.	Tires. Other.	Insulated Wire and Cable.	Other mnf. of India Rubber.	Fountain Pens.	Chewing Gum.	Reclaimed Rubber.	Scrap Rubber.
EUROPE:											
Denmark	.....	.....	$938	.....	$1,440	.....	.....	.....	.....	.....	.....
France	$3,228	$3,079	6,042	.....	.....	$18,872	$36,373	.....	$1,375	$1,912	$4,662
Greece	.....	.....	.....	.....	443	.....	195	.....	.....	.....	.....
Italy	.....	.....	250	$8,228	3,420	561	678	.....	.....	.....	.....
Netherlands	.....	.....	.....	30	1,244	4,600	1,494	$1,450	.....	.....	.....
Norway	750	.....	1,060	461	340	11,073	489	.....	.....	.....	.....
Portugal	53	.....	.....	215	.....	.....	591	200	.....	.....	.....
Russia in Europe	30	.....	.....	451,282	.....	5,537	210	.....	.....	.....	.....
Spain	.....	.....	.....	.....	585	.....	1,525	137	.....	.....	.....
Sweden	.....	.....	.....	.....	20,888	.....	.....	.....	.....	.....	.....
Switzerland	.....	.....	2,223	.....	.....	.....	202	.....	.....	.....	.....
United Kingdom—											
England	56,651	12,626	1,731	291,405	34,811	.....	113,926	2,674	8,870	9,206	13,057
Scotland	633	.....	.....	7,366	2,280	.....	1,531	498	.....	.....	16,786
Totals, Europe	$61,445	$15,705	$12,444	$758,987	$65,451	$40,643	$157,214	$4,959	$10,245	$11,118	$34,505
NORTH AMERICA:											
Bermuda	$33	.....	$301	$1,311	$591	$594	$129	.....	$20	.....	.....
British Honduras	18	.....	368	.....	.....	.....	155	.....	.....	.....	.....
Canada	.....	.....	.....	.....	.....	.....	24	.....	.....	.....	.....
Central American States—											
Costa Rica	480	.....	.....	25	392	923	272	.....	333	.....	.....
Guatemala	126	.....	.....	.....	.....	4	333	.....	.....	.....	.....
Honduras	.....	.....	.....	3	65	16	266	.....	.....	.....	.....
Nicaragua	51	.....	.....	106	.....	.....	534	.....	.....	.....	.....
Panama	13,164	.....	808	5,651	596	3,182	3,185	$174	2,054	.....	.....
Salvador	37	.....	.....	256	.....	11	968	.....	25	.....	.....
Mexico	21,108	.....	29	23,650	6,857	1,158	2,702	.....	44	.....	.....
Newfoundland and Labrador	.....	$1,635	1,596	.....	2,146	50	56	5	202	.....	.....
West Indies—											
British—											
Barbados	.....	.....	.....	344	5	.....	31	.....	.....	.....	.....
Jamaica	105	.....	.....	885	74	.....	346	10	15	.....	.....
Trinidad and Tobago	698	.....	.....	1,293	.....	15	1	.....	31	.....	.....
Other British	94	.....	10	599	185	75	199	17	10	.....	.....
Cuba	7,854	9	571	22,378	2,346	12,115	20,849	726	634	159	.....
Danish	4	.....	.....	.....	11	.....	.....	.....	.....	.....	.....
Dutch	74	.....	.....	311	2,042	43	1	.....	.....	.....	.....
French	3	.....	.....	191	.....	11	.....	126	.....	.....	.....
Haiti	67	.....	.....	103	197	77	233	.....	22	.....	.....
Santo Domingo	203	.....	94	1,268	780	29	348	1	.....	.....	.....
Totals, North America	$44,119	$1,644	$3,777	$58,374	$16,287	$17,380	$30,632	$1,195	$3,290	$159	.....
SOUTH AMERICA:											
Argentina	$1,796	.....	$1,442	$43,379	$2,740	$18,741	$13,136	$355	$3,262	.....	.....
Bolivia	175	.....	.....	.....	17	.....	83	.....	.....	.....	.....
Brazil	4,799	$95	462	30,341	2,527	8,187	17,984	627	.....	.....	.....
Chile	16,389	1,661	1,251	976	1,295	2,789	1,566	.....	590	.....	.....
Colombia	693	.....	277	2,941	691	2,487	1,454	.....	158	.....	.....
Ecuador	186	241	114	1,245	1,277	130	698	.....	.....	.....	.....
Guiana—British	61	.....	323	309	.....	47	.....	.....	8	.....	.....
Dutch	.....	.....	.....	.....	.....	.....	.....	110	.....	.....	.....
Peru	2,280	.....	.....	331	308	231	819	.....	.....	.....	.....
Uruguay	1,094	.....	.....	10,229	574	232	3,629	.....	.....	.....	.....
Venezuela	1,235	.....	91	2,374	665	469	1,696	.....	174	.....	.....
Totals, South America	$28,708	$1,997	$3,960	$92,125	$10,094	$33,313	$41,065	$1,092	$4,192	.....	.....
ASIA:											
Aden	.....	.....	.....	$442	.....	.....	.....	.....	.....	.....	.....
China	$199	.....	.....	.....	.....	$6,985	$409	.....	$126	.....	.....
British East Indies—											
British India	301	.....	.....	10,594	$8,171	20,628	650	$1,710	75	.....	.....
Straits Settlements	.....	.....	.....	1,888	180	.....	412	.....	1,111	.....	.....
Dutch East Indies	90	.....	.....	8,604	266	3,823	541	84	.....	.....	.....
Hongkong	.....	.....	.....	.....	.....	.....	25	.....	.....	.....	.....
Japan	.....	.....	$373	.....	.....	150	2,804	.....	.....	$2,538	.....
Russia in Asia	364	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Totals, Asia	$954	.....	$373	$21,528	$8,617	$31,586	$4,841	$1,794	$1,312	$2,538	.....
OCEANIA:											
British—											
Australia and Tasmania	$3,174	$28	$9,645	$195,953	$1,480	$9,330	$6,695	$9	$7,233	.....	.....
New Zealand	456	8,322	97	835	.....	.....	5,878	.....	200	.....	.....
French	232	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Philippine Islands	512	.....	532	287	2,318	68	3,521	270	.....	.....	.....
Totals, Oceania	$4,374	$8,350	$10,274	$197,075	$3,798	$9,398	$16,094	$279	$7,433	.....	.....
AFRICA:											
British Africa—											
West	.....	.....	.....	$2,789	.....	.....	.....	.....	.....	.....	.....
South	$3,583	$264	$2,473	19,829	$36,216	$3,782	$1,667	.....	$503	.....	.....
East	.....	.....	.....	585	.....	.....	.....	.....	.....	.....	.....
Canary Islands	.....	.....	.....	834	.....	.....	.....	.....	.....	.....	.....
Egypt	.....	.....	.....	.....	.....	.....	.....	.....	270	.....	.....
Portuguese Africa	2,167	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Totals, Africa	$5,750	$264	$2,473	$24,037	$36,216	$3,782	$1,667	.....	$773	.....	.....

In addition to the above the following items were exported during the same period: To England—Aeroplanes, $22,320, and balata, $2,982, and aeroplanes to Brazil, $315.

IMPORTS OF CRUDE RUBBER AND BALATA AT BORDEAUX, FRANCE.

FOR 1915 AND THE LAST 6 MONTHS OF 1914.

1915—	New Caledonia.	Soudan Niggers.	Conakry and Rio Nounez.	Upper Congo.	Ivory Coast Flakes.	Madagascar.	Manicoba.	Casamance.	Centrals.	Bissao Niggers.	Rubber Totals in Pounds.	Balata. Pounds.
January	.....	440	75,350	.....	990	143	.....	770	.....	.....	77,693	.....
February	.....	605	.....	.....	.....	.....	2,420	.....	.....	660	3,685	3,212
March and April	.....	396	47,520	52,800	1,320	2,640	9,900	.....	.....	19,580	134,156	.....
May	.....	.....	11,000	.....	1,045	6,160	.....	.....	14,960	.....	33,165	9,020
June	.....	.....	262,900	151,800	9,680	4,070	6,160	12,100	2,090	.....	448,800	23,650
July	.....	.....	28,600	13,200	2,123	1,100	82,060	9,240	.....	.....	136,323	.....
August	.....	.....	.....	.....	770	4,620	105,160	9,130	.....	.....	119,680	23,650
September	.....	.....	86,240	55,320	49,214	19,360	.....	.....	.....	.....	190,134	51,227
October	.....	26,697	67,100	216,700	12,100	3,520	.....	4,092	.....	.....	330,209	6,457
November	.....	990	.....	.....	.....	10,780	.....	2,970	.....	.....	14,740	20,240
December	.....	.....	121,440	13,860	5,280	.....	.....	2,310	.....	.....	142,890	5,280
Totals	.....	29,128	700,150	483,680	82,522	52,393	205,700	40,610	17,050	20,240	1,631,475	142,736
1914—												
July	.....	1,320	3,630	.....	13,090	3,300	.....	.....	.....	.....	21,340	8,800
August	880	.....	.....	.....	660	.....	.....	.....	.....	.....	1,540	770
September	.....	.....	.....	.....	7,920	.....	.....	.....	.....	.....	7,920	6,660
October	.....	.....	.....	.....	2,420	.....	.....	.....	.....	.....	2,420	6,930
November and December	770	13,200	72,600	.....	1,760	.....	.....	.....	.....	.....	88,330	18,700
Totals	1,650	14,520	76,230	.....	25,850	3,300	.....	.....	.....	.....	121,550	41,850

In addition to the above the following was imported: During August, 1915, Tonkin 220 pounds; during November and December, 1914, Gambia 220 pounds and Lahou Cakes 8,580 pounds.

EXPORTS OF INDIA RUBBER FROM MANAOS DURING 1915.

EXPORTERS.	NEW YORK. Fine.	Medium.	Coarse.	Caucho.	Total.	EUROPE. Fine.	Medium.	Coarse.	Caucho.	Total.	Grand Total.
Suter & Co.....*kilos*	943,414	76,396	334,856	562,310	1,916,976	561,070	51,164	9,876	225,154	847,264	2,764,240
General Rubber Co. of Brazil....	938,821	195,488	397,844	307,090	1,839,243	934,639	205,657	56,017	260,270	1,456,563	3,295,806
Pralow & Co.....	1,319,158	78,977	471,143	240,548	2,109,826	909,465	94,479	111,702	125,254	1,140,900	3,250,726
Adelbert H. Alden, Limited.....	77,805	90,420	118,025	19,407	305,657	745,753	65,477	103,921	255,322	1,170,473	1,476,130
Tancredo Porto & Co.....	352,895	73,047	80,887	27,956	534,785	414,936	91,448	72,245	98,084	676,713	1,211,498
G. Fradelizi	180,206	21,381	157,936	149,939	509,462	485,612	111,032	33,063	57,130	686,837	1,196,299
I. G. Araujo.....	21,852	3,252	7,094	911	33,109	184,599	17,386	8,465	950	211,594	244,503
Stowell & Sons.....	.....	.....	.....	.....	.....	113,253	10,208	6,538	41,460	171,459	171,459
S. A. Armazens Andresen.....	102,763	7,986	11,999	5,297	128,045	.....	.....	.....	.....	.....	128,045
B. Levy & Co.....	33,829	4,281	3,681	2,204	43,995	42,879	79	3,727	11,615	58,300	102,295
Semper & Co.....	14,479	2,168	10,285	4,068	31,000	34,430	4,415	6,007	4,635	49,487	80,487
Amorim Irmaos.....	18,509	3,542	8,104	2,198	32,353	28,934	4,205	4,132	2,610	39,881	72,234
H. Balding	20,362	.....	.....	.....	20,362	31,166	.....	311	20,165	51,642	72,004
Araujo & Arcoosa.....	3,028	579	1,801	40,548	45,756	.....	.....	.....	.....	.....	45,756
G. Dessner & Co.....	37,782	.....	1,800	44	39,626	.....	.....	.....	.....	.....	39,626
Pinho Certo & Co.....	14,200	2,753	1,717	2,770	21,440	14,560	1,120	320	.....	16,000	37,440
Nicolaus & Co.....	.....	.....	5,640	.....	5,640	24,000	800	300	.....	25,100	30,740
Sundries	47,968	4,589	12,882	1,508	66,947	17,468	4,027	23,816	19,198	64,509	131,456
	4,127,071	564,859	1,625,694	1,366,598	7,684,222	4,442,764	661,471	440,440	1,121,847	6,666,522	14,350,744
In transit, Iquitos.....	485,149	44,972	158,382	743,450	1,431,953	533,452	36,612	115,020	426,850	1,111,934	2,543,887
Totals	4,612,220	609,831	1,784,076	2,110,048	9,116,175	4,976,216	698,083	555,460	1,548,697	7,778,456	16,894,631

YEARLY EXPORTS AND IMPORTS OF CRUDE AND MANUFACTURED RUBBER BY COUNTRIES.

EXPORTS—BALATA, CRUDE AND SCRAP RUBBER.

	1914. Tons.	Value.	1915. Tons.	Value.
Federated Malay States—rubber	30,697	.....	44,524	.....
Pará—To Europe	15,985	.....	14,440	.....
To United States	21,690	.....	22,960	.....
	1913.		**1914.**	
	Tons.	Value.	Tons.	Value.
British Guiana—balata	.....	$781,410	.....	$541,093
rubber	.....	961	.....	630
Italy (Piedmont)—reclaimed:				
To U. S. and possessions	.....	.....	.....	22,000
Panama—balata	.....	210,932	.....	65,859
rubber	.....	122,995	.....	1,171
Russia—scrap	.....	232,000	.....	73,000
To United States	.....	10,314	.....	.....
	1912.		**1913.**	
	Tons.	Value.	Tons.	Value.
French West Africa—rubber	4,173	$4,881,990	2,859	$2,942,822

IMPORTS—CRUDE RUBBER AND GUTTA PERCHA.

	1913. Tons.	Value.	1914. Tons.	Value.
Russia:				
From France	.....	*	.....	$164,000
Germany	.....	*	.....	3,182,000
United Kingdom	.....	*	.....	6,881,000
Netherlands	.....	*	.....	560,000
United States	.....	*	.....	797,000
Other countries	.....	*	.....	3,223,000
Totals	.....	$20,678,000	.....	$14,807,000

*No itemized figures available.

EXPORTS—RUBBER MANUFACTURES.

	1914. Tons.	Value.	1915. Tons.	Value.
Japan—tires	.....	$345,621	.....	$1,218,065
United States—				
Scrap	2,093	408,978	1,556	356,350
Reclaimed	3,125	872,398	3,100	830,863
Belting, hose and packing	.....	2,098,506	.....	2,012,556
Rubber boots .....*pairs*	262,295	616,602	548,466	1,228,681
Rubber shoes .....*pairs*	1,675,856	1,402,503	2,098,531	1,475,697
Automobile tires—				
To Belgium	.....	$301	.....	.....
Germany	.....	81,917	.....	.....
England	.....	1,458,777	.....	$6,698,584
Canada	.....	866,999	.....	1,185,930
Mexico	.....	76,581	.....	152,578
Cuba	.....	*	.....	356,903
Australia	.....	*	.....	563,639
Philippines	.....	156,235	.....	292,735
Other countries	.....	674,306	.....	2,165,112
Totals	.....	$3,315,116	.....	$11,415,481
All other tires	.....	$452,882	.....	$1,995,319
All other rubber manufactures	.....	3,016,098	.....	5,100,959

*Included under "other countries" for 1914.

	1913. Tons.	Value.	1914. Tons.	Value.
Russia—footwear	.....	$1,390,000	.....	$1,196,000
others goods	.....	1,394,000	.....	1,146,000

IMPORTS—RUBBER MANUFACTURES.

	1913. Tons.	Value.	1914. Tons.	Value.
Algeria—from U. S.	.....	$8,299	.....	$9,409
	1912-13.		**1913-14.**	
Persia—footwear	.....	$231,744	.....	$317,285

RUBBER STATISTICS FOR THE UNITED STATES.

IMPORTS OF RUBBER AND RUBBER MANUFACTURES.

ARTICLES.	November, 1915. Pounds.	November, 1915. Value.	Eleven Months Ending November, 1915. Pounds.	Eleven Months Ending November, 1915. Value.
Unmanufactured—				
Balata .....(*free*)	268,162	$95,721	2,045,386	$770,947
Guayule gum	.....	.....	4,902,291	1,356,537
Gutta jelutong	1,342,375	50,172	18,723,068	875,448
Gutta percha	170,426	21,148	2,016,483	237,819
Total	1,780,963	$167,041	27,687,228	$3,240,751
India rubber:				
From France	50,560	$22,444	270,592	$123,186
Germany	.....	.....	6,987	843
Portugal	244,156	80,009	4,065,932	1,451,843
United Kingdom	5,878,663	3,229,791	80,120,179	43,147,626
Central America and British Honduras....	71,940	29,404	1,135,860	504,709
Mexico	132,853	50,431	1,624,394	612,712
Brazil	5,009,241	1,887,162	46,665,741	19,352,763
Other South America..	746,796	282,691	5,641,403	2,391,386
East Indies	7,115,436	3,724,395	52,597,336	27,673,973
Other countries	23,020	12,833	5,063,957	2,830,329
Total 19,272,465		$9,319,160	197,192,381	$98,089,361
Rubber scrap .....(*free*)	1,081,092	$90,070	11,092,410	$786,324
Total unmanufactured..	.....	$9,576,271	.....	$102,116,436
Chicle .....(*dutiable*)	462,983	$150,138	7,413,543	$2,720,796
Manufactured—				
Gutta percha	.....	$155	.....	$6,112
India rubber	.....	31,242	.....	420,759
Total manufactured ...	.....	$31,397	.....	$426,871
Substitutes—elasticon, etc..	.....	$2,694	.....	$16,632

EXPORTS OF DOMESTIC MERCHANDISE.

Scrap and old rubber.....	300,887	$23,213	2,825,923	$313,562
Reclaimed rubber	555,316	71,159	5,678,868	760,511
Belting, hose and packing....	.....	168,280	.....	1,804,652
Rubber boots .....(*pairs*)	80,917	188,119	423,494	963,720
Rubber shoes .....(*pairs*)	223,123	111,223	1,951,819	1,398,213
Automobile tires:				
To England	.....	825,394	.....	5,863,285
Canada	.....	128,746	.....	1,104,846
Mexico	.....	24,652	.....	133,463
Cuba	.....	24,443	.....	295,286
Australia	.....	53,468	.....	468,993
Philippines	.....	23,328	.....	266,733
Other countries	.....	285,414	.....	1,681,402
Total	.....	$1,365,445	.....	$9,814,008
All other tires	.....	$526,605	.....	$1,821,547
Fountain pens .....(*No.*)	10,289	9,409	190,198	197,925
Other rubber manufactures..	.....	526,605	.....	4,617,212
Total manufactured....	.....	$2,760,096	.....	$21,493,425

EXPORTS OF FOREIGN MERCHANDISE.

Unmanufactured—				
Balata	.....	.....	784,360	$307,479
Guayule gum	.....	.....	47,391	16,701
Gutta jelutong	2,611	$287	2,773	305
Gutta percha	814	569	49,992	10,866
India rubber	469,258	226,074	4,508,139	2,261,519
Scrap and refuse.....	6,742	438	12,687	1,107
Total unmanufactured..	.....	$227,368	.....	$2,597,977
Chicle	613	$198	454,143	$150,851
Manufactured—				
Gutta percha	.....	.....	.....	$185
India rubber	.....	$2,394	.....	10,708
Total	.....	$2,394	.....	$10,893
Substitutes—elasticon, etc.....	.....	.....	.....	$364

EXPORTS OF RUBBER GOODS TO NON-CONTIGUOUS TERRITORIES OF THE UNITED STATES.

To—				
Alaska:				
Belting, hose and packing..	.....	$3,340	.....	$110,642
Boots and shoes....(*pairs*)	3,222	8,263	59,597	172,845
Other rubber manufactures.	.....	1,280	.....	24,648
Total	.....	$12,883	.....	$308,135
Hawaii:				
Belting, hose and packing..	.....	$6,942	.....	$66,532
Automobile tires	.....	43,045	.....	404,372
Other tires	.....	4,761	.....	50,395
Other rubber manufactures.	.....	10,054	.....	62,394
Total	.....	$68,802	.....	$583,693
Philippine Islands:				
Belting, hose and packing..	.....	$4,256	.....	$48,260
Boots and shoes.....(*pairs*)	804	1,328	36,428	33,635
Tires	.....	34,533	.....	359,931
Other rubber manufactures.	.....	4,692	.....	122,247
Total	.....	$44,809	.....	$564,073
Porto Rico:				
Belting, hose and packing..	.....	$4,077	.....	$31,125
Automobile tires	.....	23,669	.....	280,630
Other tires	.....	2,271	.....	27,317
Other rubber manufactures.	.....	4,645	.....	60,535
Total	.....	$34,662	.....	$399,607

RUBBER STATISTICS FOR CANADA.

IMPORTS OF CRUDE AND MANUFACTURED RUBBER.

UNMANUFACTURED, FREE—	November, 1915. Pounds.	November, 1915. Value.	Eight Months Ending November, 1915. Pounds.	Eight Months Ending November, 1915. Value.
Rubber and gutta percha, crude caoutchouc or india rubber:				
From Great Britain	451,681	$252,482	3,328,519	$1,771,313
United States	487,865	238,995	2,812,197	1,400,869
Brit. Straits Settlements.	.....	.....	22,574	11,659
Other countries	26,880	14,087	196,778	93,579
Totals	966,426	$505,564	6,360,068	$3,277,420
Rubber, recovered:				
From Great Britain	.....	.....	4,392	$2,482
United States	352,444	$42,121	3,073,251	385,047
Totals	352,444	$42,121	3,077,643	$387,529
Hard rubber, in sheets and rods:				
From Great Britain	.....	.....	4	$5
United States	43,621	$5,316	93,671	10,987
Totals	43,621	$5,316	93,675	$10,992
Rubber substitute:				
From Great Britain	5,824	$646	16,644	$1,812
United States	29,243	2,147	299,068	21,855
Totals	35,067	$2,793	315,712	$23,667
Rubber, powdered, and rubber or gutta percha waste:				
From Great Britain	4,605	$362	7,314	$579
United States	123,546	4,491	837,050	51,216
Other countries	9,415	407	12,394	534
Totals	137,566	$5,260	856,758	$52,329
Rubber thread, not covered:				
From United States	2,632	$3,406	19,462	$26,651
Balata, crude:				
From United States	.....	.....	1,644	$991
Chicle, crude:				
From Great Britain	.....	.....	2,888	$1,675
United States	3,412	$1,225	182,971	71,757
British Honduras	.....	.....	787,008	289,622
Mexico	.....	.....	185,093	69,737
Totals	3,412	$1,225	1,157,960	$432,791

MANUFACTURED, DUTIABLE—	November, 1915. General Tariff. Value.	November, 1915. Preferential Tariff. Value.	Eight Months Ending November, 1915. General Tariff. Value.	Eight Months Ending November, 1915. Preferential Tariff. Value.
Waterproof clothing:				
From Great Britain	$47	$17,701	$3,454	$265,445
United States	4,399	.....	74,980	.....
Other countries	.....	.....	21	.....
Totals	$4,446	$17,701	$78,455	$265,445
Hose, lined with rubber:				
From Great Britain	.....	.....	.....	$389
United States	$5,957	.....	$49,929	.....
Totals	$5,957	.....	$49,929	$389
Mats and mattings:				
From Great Britain	.....	$1	.....	$85
United States	$36	.....	$930	.....
Totals	$36	$1	$930	$85
Packing:				
From Great Britain	.....	$181	$110	$1,153
United States	$4,061	.....	34,192	.....
Totals	$4,061	$181	$34,302	$1,153
Tires of rubber for all vehicles:				
From Great Britain	$21	$3,532	$9,992	$20,959
United States	177,211	.....	988,108	.....
France	242	.....	15,619	.....
Other countries	.....	.....	1,130	.....
Totals	$177,474	$3,532	$1,014,849	$20,959

*Rubber cement and all manufactures of india rubber and gutta percha, N. O. P.:				
From Great Britain	$853	$9,281	$2,268	$111,783
United States	51,056	.....	377,108	.....
Other countries	73	.....	687	.....
Totals	$51,712	$9,281	$380,063	$111,783
Hard rubber in tubes:				
From United States	$97	.....	$2,621	.....
Boots and shoes:				
From Great Britain	.....	.....	.....	$11,546
United States	$9,525	.....	$58,584	.....
Other countries	.....	.....	10	.....
Totals	$9,525	.....	$58,594	$11,546
Belting:				
From Great Britain	.....	$12	.....	$1,053
United States	$1,969	.....	$34,933	.....
Totals	$1,969	$12	$34,933	$1,053
Webbing—over one inch wide:				
From Great Britain	.....	$1,478	$42	$7,930
United States	$15,955	.....	94,406	.....
Other countries	.....	.....	330	.....
Totals	$15,955	$1,478	$94,778	$7,930

*In addition, the imports of rubber cement and all manufactures of india rubber and gutta percha not otherwise provided for amounted to $11 from Great Britain and $230 from other countries for November; and $207 from Great Britain, and $1,535 from other countries for the eight months ending November, 1915, the values being at treaty rates.

EXPORTS OF DOMESTIC AND FOREIGN RUBBER GOODS.

	November, 1915.		Eight Months Ending November, 1915.	
MANUFACTURED, DUTIABLE—	Product of Canada. Value.	Re-exports of foreign goods. Value.	Product of Canada. Value.	Re-exports of foreign goods. Value.
Belting:				
To United States	$87	.....	$424	$58
Newfoundland	38	.....	112	.....
Other countries	.....	.....	33	.....
Totals	$125	.....	$569	$58
Hose:				
To Great Britain	$6,495	.....	$11,608	.....
United States	682	.....	3,804	$201
Newfoundland	71	.....	2,966	.....
Other countries	.....	.....	1,760	.....
Totals	$7,248	.....	$20,138	$201
Boots and shoes:				
To Great Britain	$191,481	.....	$258,385	.....
United States	9	.....	3,526	$492
Newfoundland	10,387	.....	56,066	.....
Australia	10,320	.....	22,013	327
Other countries	2,534	.....	15,168	.....
Totals	$214,731	.....	$355,158	$819
Mats and matting:				
To various countries	.....	.....	$418	.....
Clothing:				
To Great Britain	.....	.....	$27	$10
United States	.....	.....	39	202
Newfoundland	.....	.....	140	.....
Other countries	$38	.....	62	.....
Totals	$38	.....	$268	$212
*Rubber waste:				
To United States	$38,357	.....	$358,607	$1,964
All other manf., N. O. P.:				
To Great Britain	$81,832	.....	$526,596	$1,954
United States	13,722	$1,135	88,367	269,524
Newfound'and	589	.....	4,626	785
Australia	.....	.....	2,964	.....
Other countries	4,561	.....	66,549	10
Totals	$100,704	$1,135	$689,102	$272,273
†Gum chicle:				
To Great Britain	$5,000	.....	$10,000	.....
United States	44,204	$15,000	467,703	$109,418
Other countries	.....	.....	42,216	1,107
Totals	$49,204	$15,000	$519,919	$110,525

*During November, 613,800 pounds of rubber waste was exported to United States, making a total of 5,897,500 pounds for the eight months ending November, 1915.

†During November, 10,000 pounds of gum chicle was exported to Great Britain, and 104,375 pounds to the United States. During the eight months ending November, 1915, 20,000 pounds of gum chicle was exported to Great Britain, 1,078,585 to the United States, and 66,834 pounds to other countries.

UNITED KINGDOM RUBBER STATISTICS FOR 1915.

IMPORTS.

	December, 1915.		Total, 1915.	
UNMANUFACTURED—	Pounds.	Value.	Pounds.	Value.
*Crude rubber:				
From Dutch East Indies	346,000	$211,595	6,411,900	$3,480,494
French West Africa	380,500	179,723	1,623,400	714,031
Gold Coast	44,300	15,426	631,800	193,180
Other countries in Africa	533,800	248,132	6,255,500	2,611,193
Peru	12,200	6,365	1,658,200	866,397
Brazil	1,839,200	1,093,530	28,639,100	15,750,186
British India	404,300	271,474	3,288,800	1,809,441
Straits Settlements, including Labuan	4,396,890	2,896,599	66,053,200	35,890,274
Federated Malay States	1,927,700	1,284,551	28,880,300	16,232,745
Ceylon and dependencies	2,026,000	1,395,070	28,609,700	15,698,859
Other countries	211,000	125,850	4,003,700	1,974,215
*Totals	12,121,800	$7,768,316	176,045,600	$95,221,013
*Waste and reclaimed rubber	325,100	$38,350	4,180,000	$472,975
Gutta percha	986,800	412,687	7,589,400	3,248,575
MANUFACTURED—				
Apparel, waterproofed	.....	$2,117	.....	$26,127
Boots and shoes—*dozen pairs*	27,935	229,426	160,462	1,284,304
Insulated wire	.....	47,764	.....	468,251
Submarine cables	.....	13,501	.....	15,013
Motor tires and tubes	.....	1,030,836	.....	9,654,998
Motorcycle tires and tubes	.....	2,950	.....	510,898
Cycle tires and tubes	.....	78,946	.....	316,648
Tires not specified	.....	3,820	.....	100,199

EXPORTS.

	December, 1915.		Total, 1915.	
MANUFACTURED—	Pounds.	Value.	Pounds.	Value.
Apparel, waterproofed:				
To France	.....	$45,032	.....	$217,854
British South Africa	.....	10,269	.....	203,342
British East Indies	.....	3,645	.....	124,815
Australia	.....	13,977	.....	223,633
New Zealand	.....	16,971	.....	147,977
Canada	.....	9,168	.....	431,933
Other countries	.....	57,644	.....	1,203,083
Totals	.....	$156,706	.....	$2,552,637
Boots and shoes—*dozen pairs*	10,329	$74,668	118,716	$677,192
Insulated wire	.....	170,622	.....	1,786,849
Submarine cables	.....	28,528	.....	1,745,863
Automobile tires and tubes	.....	280,427	.....	3,231,482
Motorcycle tires and tubes	.....	32,746	.....	392,095
Cycle tires and tubes	.....	223,385	.....	2,095,331
Tires not specified	.....	58,966	.....	556,198
Manufactures not specified	.....	535,003	.....	5,159,084

EXPORTS—FOREIGN AND COLONIAL.

	December, 1915.		Total, 1915.	
UNMANUFACTURED—	Pounds.	Value.	Pounds.	Value.
*Crude rubber:				
To Russia	1,755,500	$963,291	25,906,100	$13,893,977
France	1,540,100	931,540	15,209,700	8,612,406
United States	5,076,000	2,935,424	83,180,100	45,071,227
Other countries	1,757,500	1,041,333	17,989,500	10,014,701
Totals	10,129,100	$5,871,588	142,285,400	$77,592,311
*Waste and reclaimed	10,129,100	$4,219	142,285,400	$100,447
Gutta percha	52,500	14,755	882,100	367,299
MANUFACTURED—				
Apparel, waterproofed	.....	$1,011	.....	$3,378
Boots and shoes—*dozen pairs*	306	2,434	12,077	85,453
Insulated wire	.....	11,689	.....	44,027
Automobile tires and tubes	.....	167,955	.....	2,733,536
Motorcycle tires and tubes	.....	4,962	.....	66,893
Cycle tires and tubes	.....	4,243	.....	112,655
Tires not specified	.....	768	.....	31,940

*Included in "Rubber" prior to 1915. After 1914 "Rubber" is separated into "Crude" and "Waste and Reclaimed."

BURMA'S PACKING TRADE.

Engine and boiler packing materials, including asbestos, are imported through the port of Rangoon, Burma, to the value of $45,000 a year, reports Consul Moorhead at Rangoon. Great Britain supplies close to $40,000 worth and the United States around $3,000 worth. In 1914 the value of exports of these goods from the United States to Burma was inordinately swelled by one big shipment of rubber packing to a Rangoon oil company.

THE MARKET FOR CHEMICALS AND COMPOUNDING INGREDIENTS.

IN general the February market has been characterized by continued firmness due to shortage of supply. All advances have been retained with higher tendency. Manufacturers dependent on spot stocks are said to be paying almost prohibitive prices in some cases. Not many are thought to be so situated, especially among the larger buyers, as most wants have been anticipated.

ZINC OXIDE.

Contract deliveries are taking the bulk of the domestic output of zinc oxide into consumption and sellers have but little to offer. Stocks in second hands have been selling for 17 to 18 cents per pound. Producers claim that consumers who took supplies in the past are obtaining their usual amounts and even beyond that supply, as their requirements increased. The production of zinc oxide in this country is larger than ever before.

LITHOPONE.

Small lots of foreign lithopone are on the market, but arrivals are limited, and no sales have been noted under 14 cents per pound. Domestic lithopone sells at 13½ cents per pound. A large part of the production is sold ahead and this causes a strong situation in the spot market.

Samples of a French pigment have reached New York and the claim is made concerning the material that it serves many of the purposes of zinc oxide and lithopone.

LITHARGE.

There is a scarcity of stock in all lead products, causing reduced offerings and firm prices. Litharge has shown a fractional advance.

NAPHTHA.

The report of the investigation by the Bureau of Mines on the rise in prices of gasoline, has been made public by Secretary Lane. The upshot of the matter is that the consumption of gasoline as motor fuel is rapidly increasing and the production of crude oil has reached a maximum. It is stated that there are no world's figures available on the production and consumption of gasoline.

There is reason to anticipate still higher prices for gasoline which may ultimately affect the prices of proofed fabrics unless relief is found in a practical method of solvent recovery.

CAUSTIC SODA.

Prices have advanced during the month. It is stated that recent sales of about 1,000 tons have been made to France, Italy and other foreign countries.

PRICES OF CHEMICAL AND COMPOUNDING INGREDIENTS. NEW YORK, FEBRUARY 29, 1916.

Subject to change without notice.

Acetone (drums)	lb.	$0.42	@$0.44
Acid, acetic, 28 per cent. (bbls.)	lb.	.06	@ .07
glacial, 99% (carboys)	lb.	.50	@
Aluminum Flake (carloads)	ton	18.00	@20.00
Ammonium carbonate	lb.	.08½	@ .09½
Antimony, crimson, sulphuret of (casks)	lb.	.85	@ .90
golden, sulphuret of (casks)	lb.	.65	@ .70
Asbestine	ton	19.00	@20.00
Asbestos	lb.	.04	@ .05
Asphaltum "G" Brilliant	lb.	.03	@ .03½
Barium sulphate, precipitated	ton	120.00	@
Barytes, pure white	ton	24.00	@37.50
off color	ton	23.00	@24.00
Basofor	ton	120.00	@
Benzol, pure	gal.	.80	@ .90
Beta-Naphthol	lb.	1.50	@ 3.00
Black Hypo	lb.	.39	@ .40
Bone ash	lb.	.10	@
black	lb.	.03½	@ .07
Cadmium tri-sulphate		None	
yellow		None	
Cantella gum	lb.	.27½	@ .35
Carbon, bisulphide (drums)	lb.	.06	@ .15
black (cases)	lb.	.10	@ .15
tetrachloride (drums)	lb.	.16	@ .17
Caustic soda, 76 per cent. (bbls.)	cwt.	6.25	@
Chalk, precipitated, extra light	lb.	.05	@
precipitated, heavy	lb.	.04	@
China clay, domestic	ton	12.50	@20.50
imported	ton	22.00	@40.00
Chrome, green	lb.	.30	@ .32
yellow	lb.	.50	@ .55
Coal tar	gal.	.09	@
Cotton linters	lb.	.07	@ .12
Emarex	ton	70.00	@
Gas black	lb.	.22	@ .25
Gilsonite	ton	37.50	@42.50
Glycerine, C. P. (drums)	lb.	.50	@ .52
Graphite, flake (250 to 400 pound bbl.)	lb.	.10	@ .20
powdered (250 to 400 pound bbl.)	lb.	.05	@ .06
Green oxide of chromium (casks)	lb.	.60	@ .70
Ground glass	lb.	.03	@
Indian red, reduced grades	lb.	.03¼	@ .07
pure	lb.	.07	@ .10
Infusorial earth, powdered	ton	50.00	@
bolted	ton	60.00	@
Iron oxide, red, reduced grades	lb.	.02¼	@ .06
red, pure, bright	lb.	.07	@ .15
Ivory, black	lb.	.10	@ .24
Lampblack	lb.	.05½	@ .15
Lead, red oxide of	lb.	.03	@ .08½
sublimed blue	lb.	.06¾	@ .07
white, basic carbonate	lb.	.07	@
white, basic sulphate	lb.	.06¾	@
Lime, flour	lb.	.01	@ .01½
Litharge	lb.	.08½	@ .08¾
English	lb.	None	
Lithopone, domestic	lb.	.11	@ .15
Imported	lb.	.11	@ .16
Magnesia, carbonate	lb.	.08	@ .10
calcined, heavy	lb.	.35	@ .40
light	lb.	.35	@ .40
Magnesite, calcined, powdered	ton	35.00	@60.00
Mica, powdered	lb.	.03½	@ .05
Mineral rubber	lb.	.01¾	@ .04½
Naphtha, stove gasolene (steel bbls.)	gal.	.21	@ .23
66@68 degrees "	gal.	.25	@ .27
68@70 degrees "	gal.	.26	@ .28
V. M. & P. "	gal.	.21	@ .22
Oil, aniline	lb.	.90	@ 1.00
linseed (bbl.)	gal.	.77	@ .81
palm	gal.	.10	@ .10¼
pine (cases)	gal.	.60	@ .65
rapeseed	gal.	1.03	@ 1.12
rosin, heavy body	gal.	.32	@ .36
tar (cases)	gal.	.30	@ .31
soluble aniline colors, yellow, orange, red, violet, blue, green	lb.	3.00	@ 3.30
Orange mineral, domestic	lb.	.10¼	@
Paragol	lb.	.07⅞	@
Petroleum grease	lb.	.04	@
Pine tar, retort	gal.	.13	@ .17
Pitch, burgundy	lb.	.04½	@ .05½
pine	lb.	.02½	@
Plaster of paris	lb.	1.50	@ 1.70
Prussian blue	lb.	1.50	@ 1.80
Pumice stone, powdered (bbls.)	lb.	.02	@ .03
Resin, Pontianak, refined	lb.	.12	@ .15
granulated	lb.	.12	@ .15
fused	lb.	.12	@ .15
Rosin (280 pound bbls.)	lb.	5.50	@ 8.65
Rotten stone, powdered	lb.	.04	@ .04½
Rubber black	lb.	None	
Rubber substitute, black	lb.	.07	@ .16
white	lb.	.09½	@ .16
Shellac, fine orange	lb.	.25	@ .28
Soapstone, powdered	ton	10.00	@12.00
Starch, corn, powdered	lb.	.02¼	@ .02½
Sulphur chloride (drums)	lb.	.07	@ .15
Sulphur, flowers	cwt.	2.30	@ 2.70
Sulphuric acid, 60°	lb.	.02¼	@ .02½
Talc, American	ton	8.50	@13.00
French	ton	25.00	@30.00
Toluol, pure	gal.	4.00	@ 4.50
Tripolite earth, powdered	ton	50.00	@
bolted	ton	60.00	@
Turpentine, pure gum spirits	gal.	.58	@
wood	gal.	.54	@
Ultramarine, blue	lb.	.06	@ .35
Vermilion, brilliant	lb.	None	
Chinese	lb.	2.50	@ 3.00
English	lb.	3.50	@ 4.00
Wax, bayberry	lb.	.22	@ .24
beeswax, white	lb.	.47	@ .55
ceresin, white	lb.	.14	@ .16
carnauba	lb.	.26	@ .47
ozokerite, black	lb.	.50	@ .65
green	lb.	.65	@ .85
montan	lb.	.30	@ .32
paraffin, refined, 118/120 m. p. (cases)	lb.	.05½	@
123/125 m. p. (cases)	lb.	.05½	@
128/130 m. p. (cases)	lb.	.07½	@
133/136 m. p. (cases)	lb.	.06½	@ .08
crude, white, 117/119 m. p. (bbls.)	lb.	.04½	@
yellow, 124/126 m. p. (bbls.)	lb.	.04½	@
Whiting, Alba	cwt.	.45	@ .60
commercial	cwt.	.55	@ .65
gilders	cwt.	.65	@ .75
Paris white, American	cwt.	.85	@ .95
English cliffstone	cwt.	.90	@ 1.25
Wood pulp, XXX	lb.	.23	@ .28
Yellow ochre	lb.	.10	@ .15
Zinc oxide, American process, horsehead brand			
"special" f. o. b. factory	lb.	.09½	@ .09¾
"XX red " "	lb.	.08¾	@ .08¾
French process, green seal. " "	lb.	.16½	@ .16¾
red seal.. " "	lb.	.16	@ .16¼
white seal. " "	lb.	.17	@ .17¼
Zinc oxide, imported, white seal	lb.	.28	@
Zinc sulphide, pure	lb.	.07¾	@ .14

MARKET FOR COTTON AND OTHER FABRICS.

EGYPTIAN COTTON.

THE reports from Alexandria indicate very unsettled market conditions. The exchange is still closed and trading is wholly confined to individual operators. Speculation has been very active and the situation is temporarily in favor of the bull side of the market. Spot stocks of all available qualities are daily decreasing due to the active demand, and prices have advanced 6 cents since the first of February—26 cents being the quotation at this writing. The great difficulty surrounding cotton shipments from Alexandria is really the underlying cause of the present market disturbance.

SEA ISLAND COTTON.

This market has been very strong during the month, largely due to the scarcity of Egyptians. The crop has nearly all been marketed—only crop lots remaining unsold for which there has been some demand on account of northern mills at 27 to 30 cents. The net receipts at southern shipping ports from August 1, 1915, to February 19, 1916, were, in round numbers, 67,000 bales, of which 47,000 bales were taken by northern mills.

COTTON DUCK.

There has been a marked demand during the month that has just passed, for 29-inch cotton duck for European account. Domestic business, as reported from various sources, is very good and consistently improving. Hose and mechanical duck are in active demand and the question of delivery is now the first consideration in buying orders. Balata belting duck has been noticeably active of late, contracts having been written for this material covering the balance of the year. The wide ducks are most active which has resulted in a scarcity of these stocks which in normal times are plentiful. This makes for higher prices on belting duck and accounts for the present advanced prices.

Prices on all ducks, drills and osnaburgs are very strong and indicate higher levels. Mills are working at full capacity on orders that bespeak active operations until October next. Spot stocks are not to be had with the exception of an occasional run over, and mill and warehouse stocks are the smallest in years.

TIRE FABRICS.

The domestic consumption of tire fabrics continues in increasing volume and suggests the possibility of demand exceeding production. The mills are exerting every effort to meet the situation with prompt deliveries, despite the besetting difficulties in securing raw materials, and the delays caused by continued labor troubles. The spindle capacity of the mills is taxed to the utmost and new equipment is difficult to obtain and install promptly.

Prices on all building fabrics have advanced 2 cents per square yard since our last report and there appears to be no reason to expect lower prices for some time.

The following are New York quotations on February 26, 1916:

(Subject to change without notice.)

Aeroplane and Balloon Fabrics:			
Wamsutta, S. A. I. L. No. 1, 40-inch	*yard*	$0.22	@
No. 4, 38½		.22	@
O/X B. 36-inch		.12¼	@
Wool Stockinettes—52 inch:			
A—14-ounce	*yard*	1.12½	@
B—14-ounce		1.25	@
C—14-ounce		1.50	@
Cotton Stockinettes—52-inch:			
D—14-ounce	*yard*	.49 @	.50
E—11½-ounce		.39 @	.40
F—14-ounce		.53 @	.54
G—8-ounce		.43 @	.44
H—11-ounce		.48 @	.49
I — 9-ounce		.40½ @	.41½
Colors—white, black, blue, brown.			
Tire Fabrics:			
17¼-ounce Sea Island, combed	*square yard*	.77 @	.80
17¼-ounce Egyptian, combed		.65 @	.67
17¼-ounce Egyptian, carded		.57 @	.60
17¼-ounce Peelers, carded		.45 @	.47
Sheeting:			
40-inch 2.35-yard	*yard*	.10¼ @	.10¾
40-inch 2.50-yard		.09 @	.09½
40-inch 2.70-yard		.08¼ @	.08½
40-inch 2.85-yard		.07¾ @	.08¼
40-inch 3.15-yard		.08 @	.08¼
Osnaburgs:			
40-inch 2.25-yard	*yard*	.11⅛ @	
40-inch 2.48-yard		.10¼ @	
37½-inch 2.42-yard		.10⅜ @	
Mechanical Ducks:			
Hose	*pound*	.27 @	.27½
Belting		.26 @	.27
Carriage Cloth Duck:			
38-inch 2.00-yard enameling duck	*yard*	.13½ @	.14
38-inch 1.74-yard		.14½ @	.15
72-inch 16.66-ounce		.28 @	.29
72-inch 17.21-ounce		.29 @	.30
Drills:			
38-inch 2.00-yard	*yard*	.13 @	
40-inch 2.47-yard		.10½ @	.11
52-inch 1.90-yard		.14¼ @	.14½
52-inch 1.95-yard		.12½ @	.15
60-inch 1.52-yard		.16¼ @	.20¼
Yarns:			
Garden Hose 12/2 cabled	*pound*	.23 @	.24
Fire Hose 12/1		.26 @	.27
Imported Woolen Fabrics Specially Prepared for Rubberizing.			
Plain and Fancies:			
63-inch, 3¼ to 7½ ounces per square yard	*yard*	.38 @	1.55
36-inch, 2¾ to 5 ounces per square yard		.35 @	.85
Plaid Lining:			
63-inch, 2 to 4 ounces per square yard	*yard*	.35 @	.75
36-inch, 2 to 4 ounces per square yard		.20 @	.45
Domestic Worsted Fabrics:			
36-inch, 4½ to 8 ounces per square yard	*yard*	.20 @	.35
Raincoat Cloth:			
Bombazine	*yard*	.06 @	.07½
Twills		.10 @	.12½
Tweed		.10 @	.30
Tweed, printed		.06 @	.11
Plaid		.06 @	.08
Repp		.18½ @	.22
Burlaps:			
32—7½-ounce	*100 yards*	7.20 @	
40—7½-ounce		7.65 @	
40—8-ounce		7.75 @	
40—10-ounce		11.35 @	
40—10½-ounce		11.50 @	
45—7½-ounce		9.15 @	
45—8-ounce		9.25 @	
48—10-ounce		15.00 @	

CANADIAN IMPORTS OF COTTON FABRICS.

Articles, Dutiable—	November, 1915. General Tariff. Value.	November, 1915. Preferential Tariff. Value.	Eight Months Ending November, 1915. General Tariff. Value.	Eight Months Ending November, 1915. Preferential Tariff. Value.
Stockinettes for the manufacture of boots and shoes:				
From Great Britain	.....	.....	.....	$1,217
United States	$14,361	.....	$58,679	.....
Totals	$14,361	.....	$58,679	$1,217
Cotton duck, gray or white, N. O. P.:				
From Great Britain	.....	$7,556	$2,828	$28,669
United States	$25,688	.....	223,893	.....
Other countries	.....	.....	94	.....
Totals	$25,688	$7,556	$226,815	$28,669

Articles Free.—Cotton or linen seamless duck, in circular form for use in hose pipe, was imported from the United States only, and amounted to $15,950 for November, making a total of $41,548 for the eight months ending November, 1915.

INDIA RUBBER WORLD
FOUNDED 1889

Vol. 53. MARCH 1, 1916. No. 6.

TABLE OF CONTENTS.

Editorials: Pages.
- Preparedness and the Rubber Trade ... 273
- The American Rubber Exports in 1915 ... 273
- The Rubber Club's New President ... 274
- Crude Rubber Distribution ... 274
- Tariff Commission, The Proposed ... 275
- Golf Ball, The ... 275

Rubber Club's Sixteenth Annual Banquet ... 276-280
Illustrations of Banquet and Portraits.
- Members and Guests Present ... 280-281

Rubber Club:
- Gains Many Members ... 281
- Annual Meeting ... 282-285
Illustrations, Portraits of Directors.

Spreader Fires, Causes of ... 286

New Trade Publications ... 286

Golf Ball Industry, Development and Changes in ... *Illustrated* 287

Chemistry:
- What the Rubber Chemists Are Doing ... 289
- Vulcanization Experiments ... 289
- Chemical Treatment of Rubber ... 290
- Other Chemical Patents ... 290
- Laboratory Apparatus ... *Illustrated* 290

Machines and Appliances, New ... *Illustrated* 291-293

Rotary Vacuum Dryer for Rubber Scrap. Multiple Expansion Joints. Sewing Machine for Re-Treading Tire Casings. Trabue's Label Gumming Machine. Machine for Panning Rubber Covered Wire. Hydraulic Valve for Rubber Mills. A Garvin Hard Rubber Lathe.

Machinery Patents: Price's Dipping and Vulcanizing Apparatus. Tire Flap Making Machine. Automatic Mixing Mill. Other Machinery Patents.

Hunter Dry Kiln—A Comparison ... 294

Editor's Book Table ... 295

"Technologie Der Kautschukwaren." "Transactions of the Rubber Growers' Association 1915." "Agricultural Bulletin of the Federated Malay States." "Stubbs' Buyers' Directory for the Wholesale Drug, Chemical and Allied Trades 1916." "Dictionary of Textiles."

New Goods and Specialties ... *Illustrated* 296-298

Thermo Steaming Bag. Drop Bottle with Rubber Cap and Bulb. Goodrich Safety Respirator. Jones Pneumatic Tire Spring. Veeder Clutch Speed Counter. "Du-Tell" Puncture Finder. Dainty Raincoat. "On the Level" Rubber Heel. 1916 "Goodrich Championship" Tennis Ball. "Vacu-Vas" for Flowers. Rubin Duplex Water Bottle. Watch Holder for Steering Wheel. "Buddy" Inside Lace Pacs. Rubber-Coated Patients' Bib and Laboratory Apron. Silk Outing Pump. "Bi-Plane" Sidewalk Coaster. Ford Air Break. Rubber Tatting Shuttle and Thimble. Work Shoe with Rubber Heel and Rocker Bar. Rubber Sewing Finger.

Tires:
- "Giant" Tire Twelve Inches Wide ... *Illustrated* 307
- Vacuum Cup Shock Absorbing Liners ... *Illustrated* 307
- "Clincher Cross" Tire ... *Illustrated* 307

Obituary Record ... 299-300

C. H. Arnold (Portrait), J. H. McKechnie (Portrait), Sir Clements Robert Markham, Moriz Josef Reithoffer, Richard S. Bryant, Th. L. A. Runge.

American Rubber Trade—News Notes and Personals ... 301-308
- New Incorporations ... 305
- Otis R. Cook—Sketch and Portrait ... 306
- R. B. Tracy—Sketch and Portrait ... 307

Domestic Correspondence:
- Akron ... *By Our Correspondent* 308
- Boston ... *Illustrated* 309
- Trenton ... *Illustrated* 310
- Rhode Island ... *By Our Correspondent* 311

Foreign Rubber News:
- Germany ... *By Our Correspondent* 312
- Russia ... *By Our Correspondent* 313
- Great Britain ... *By Our Correspondent* 314
- France ... *By Our Correspondent* 314
- European Trade Notes ... 315

Planting Notes, Rubber ... 315-317
- Rubber Situation in the Guianas ... *By Our Correspondent* 315
- Rubber Tapping in South Kurg, India ... 317

Patents Relating to Rubber ... 318-319
United States, Canada, United Kingdom, French Republic, New Zealand.

Trade Marks ... 319

Designs ... 319

Markets:
- Rubber Scrap ... 319
- Crude Rubber ... 320-321
- Singapore Rubber Auction ... 321
- Chemical and Ingredients ... 328
- Cotton and Other Fabrics ... 329

Statistics:
- American Rubber Exports in 1915 ... *Editorial* 273
- Amsterdam Crude Rubber Market in 1914 ... 294
- Brazil, Rubber Exports from Manaos During 1915 ... 325
- British Guiana, Balata Exported ... 316
- Canada, Rubber Statistics for Eight Months ... 326
- Imports of Cotton Fabrics ... 329
- Ceylon Rubber Exports ... 321
- Federated Malay States Rubber Exports ... 321
- France, Imports of Rubber and Balata ... 325
- Germany, Imports and Exports of Waste ... 316
- Golf Balls ... *Editorial* 275
- Malaya, Rubber Exports ... 321
- New York Arrivals of Crude Rubber ... 322-323
- Statistics of Crude and Manufactured Rubber ... 323-324
- Rubber, Crude and Manufactured, Yearly Imports and Exports by Countries ... 325
- Crude, Distribution ... *Editorial* 274
- Straits Settlements, Rubber Exports ... 321
- United States, Rubber Afloat to ... 321
- Customs House Statistics ... 323
- Rubber Statistics for Eleven Months ... 326
- United Kingdom, Imports and Exports of Crude Rubber for January ... 321
- Statistics for 1915 ... 327

RUBBER-TIRED AUTO TRAILERS.

An unexpected effect of the war now raging in Europe has been the bringing into evidence of the value of small rubber-tired automobile trailers. The tremendous number of wounded which the warring nations have been obliged to handle caused them to resort to these trailers for increasing the capacity of their motor ambulances.

Various types of trailers have been produced, but aside from the large ones with capacities of from 5 to 15 tons, they were nearly all made to order or the work of amateurs. Now the manufacture of trailers susceptible of being drawn by ordinary popular and low-priced touring cars and roadsters has been taken up on a commercial scale, and there are several American concerns offering rubber-tired trailers capable of carrying from 750 to 1,250 pounds, at prices that put them within the reach of those who are most interested in this economic and practical device for hauling freight by automobile. Now the small tradesman can hook a rubber-tired trailer to the back of his pleasure car and deliver substantial loads without soiling his machine.